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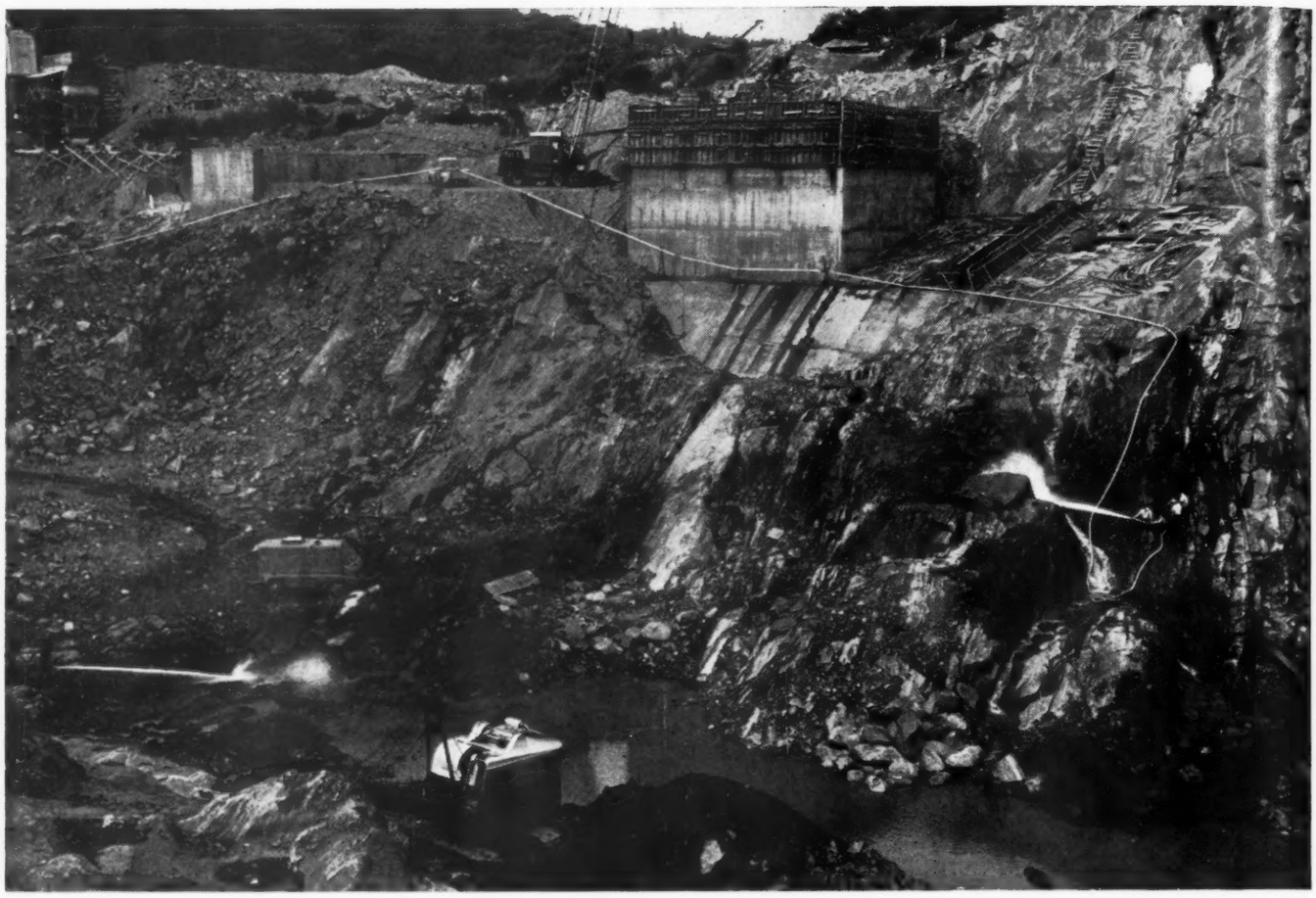
DECEMBER 1958
A Buttenheim Publication

Contractors and Engineers

magazine of modern construction

Concrete batching for bridge anchorage

Page 54



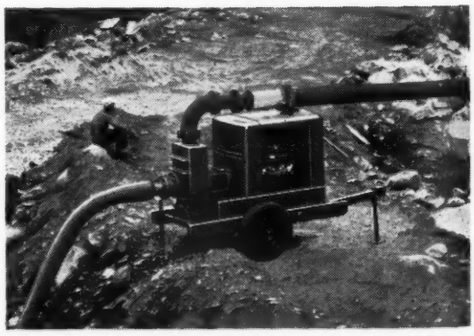
Work Speeded on Earth Dam with *MARLOW JETTING PUMPS*

4½ million dollar project scheduled for completion soon!

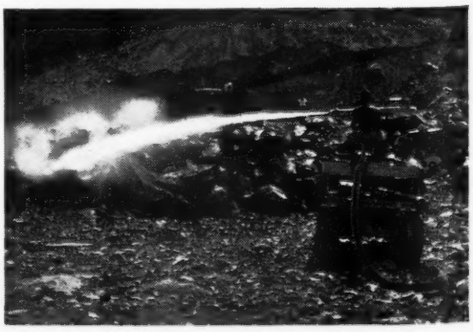
A unique application for Marlow jetting pumps was on a 4½ million dollar earth dam at Riverton, Conn. The dam, located on the Farmington River about 10 miles north of Winsted, is part of the flood control soon to be completed in the area.

To save time and money, the contractor used high pressure streams of water to work fines into the rock fill on the face of the dam. Two Marlow 6E6 pumps, powered by Chrysler V8 engines, were used to supply water at 75 p.s.i. at the nozzles. These dependable Marlows pump 1,000 g.p.m. at constant nozzle pressure even when work was done at the top of the dam, 90 feet above the level of the river. As many as three of these 2-inch nozzles were used with the two pumps. Water drained down to a low point on the project where a third Marlow was used for dewatering.

Marlow builds a complete line of AGC rated pumps and dependable Mud Hogs for handling muddy or trash-laden water. Write today for Bulletin CO-4 describing these pumps and the name of your Marlow Dealer.



This Marlow high-pressure pump powered by a Chrysler V8 Engine supplied water at a pump pressure of 130 p.s.i.



A two-inch nozzle mounted on a half-track saved time in moving the jetting stream from one location to another.

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Editorial

Down-to-earth construction

The strange-looking structure pictured here is a model of a "moon building", designed by the Wonder Building Corporation of America, a Chicago firm. Its technical director, Dr. John S. Rinehart, describes it as a permanent structure to house living quarters for moon explorers, laboratories for scientific research, maintenance shops for space vehicles, and stations for earth-moon communications. If the construction of such a project had been suggested only a year ago, everyone would probably have dismissed the subject as an imaginative creation of a science-fiction writer. But current attempts to probe space with a shot to the moon have put us squarely in the early stages of space exploration. And while Dr. Rinehart, as a former associate director of the Smithsonian Astrophysical Observatory at Cambridge, Mass., may have his head above the clouds, he has his feet firmly planted into planet earth, since he is also a director of the mining research laboratory at the Colorado School of Mines.

Wonder's prefab metal building would be 340 × 160 × 65 feet high, and protected from interplanetary meteoric dust by a shield 460 feet long, 380 feet wide, and 83 feet high. Behind the plastic bubble in front is an observatory that can be shielded from ultraviolet radiation by sliding metal doors. Future moon rockets would transport the building from earth in small sections. Assemblage and construction by man on the moon could start in ten years, according to savant Rinehart.

However, we are not recommending that American builders take courses immediately in techniques of construction on satellites or neighboring planets. A quick glance around mother earth indicates enough work on hand to keep the construction industry busy here for many years ahead. For instance, 1958 marks the eleventh straight year that highway construction has increased throughout the world. The current year, according to International Road Federation figures, is shaping up to a 20 per cent increase over 1957 in road building on a world basis. And 1959 is expected to have an even greater record, for the United States federal-aid highway program will be the largest in history.

The new jet airliners being put into operation need longer runways than piston-propeller-type planes, which indicates that airports all over the world must expand their ground facilities. Dirt-moving and paving contractors should benefit from new runway or extension programs.

Huge new water-resource projects may be expected, particularly in the West where a lack of water has long been a threat to the growing population of that area.

In the large cities of the East, engineering and construction firms are being called upon to carry out redevelopment programs in revitalizing slums or outmoded areas. Such urban renewal plans may open an entire new field to building contractors.

One of the biggest dirt-moving jobs ever—a billion cubic yards of earth and rock—is currently being studied as part of the Panama Canal expansion project. Added facilities for moving ships between the Atlantic and Pacific oceans are needed. This improvement may involve widening and deepening the present canal; larger lock construction; converting the canal to a sea-level channel; or even digging a new canal at some distant site in Central America.

The construction man still has the world for his oyster if he but looks around to see where he can put his talents and techniques to good use. He need not project himself to the moon, at this time, in order to find new projects to build, dirt to move, or highways to pave.

CONTRACTORS AND ENGINEERS

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This Erie Strayer batch plant, equipped with two Worthington mixers, turns out concrete for the Queens anchorage of the new Throgs Neck Bridge in New York City. The crane is a Manitowoc 3900. *Page 54.*

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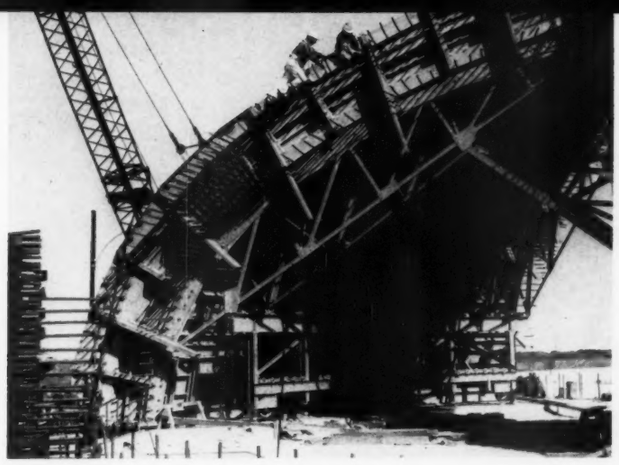
Rubber-tire traveler handles forms for domes at missile test center



A traveler used in building one of the concrete control domes at Cape Canaveral, Fla., is designed to be lowered by screw jacks until the rubber tires touch the concrete slab. The stripped form is then moved to the next position and raised by the jacks.

Steel forms and a rubber-tire traveler, made in sections small enough to pass through a 6×8-foot doorway, proved vital in constructing four dome-shaped, blastproof concrete control rooms at the Air Force Missile Test Center, Cape Canaveral, Fla.

Concrete for each structure was first placed in a 5-foot-deep 12-foot-diameter central compression ring. Temporary support for the ring was provided by 12 wide-flanged steel beams. Blaw-Knox construction-joint forms, of 5 × 5-foot panels, were used to form the cap for the dome.

For each of the three 120-degree pours, the wedge-shaped form panels varied from 12 feet wide at inside base to 1 foot at inside crown. All inside forms were braced by steel framework mounted on rubber-tire travelers, which moved over a 5-foot-thick 12-foot-wide concrete floor slab. The travelers were 6 feet from the forms at the inside base. Struts were employed at the top of each traveler and anchored to the temporary center pedestal.

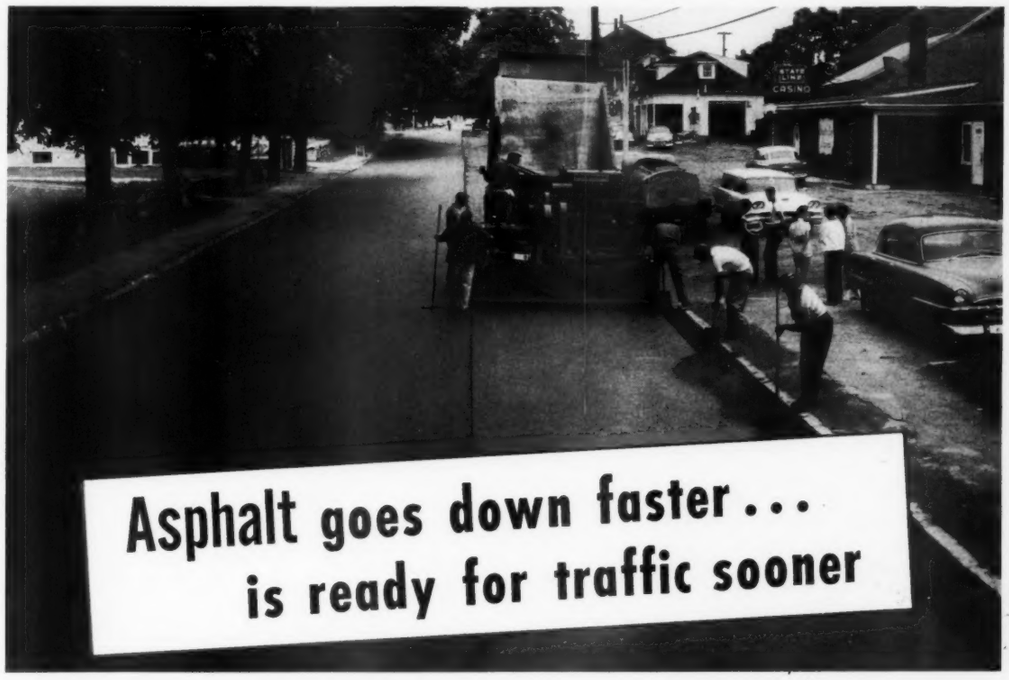
Outside surface forms also measured 12 feet wide at the base and narrowed to 4 feet two-thirds of the distance between base and crown. Outside surface forms had only to reach this far, because the upper third pour of concrete was past the angle of repose. The wedge-shaped or orange peel sections for the lower two-thirds of the dome's exterior were positioned by two truck-mounted cranes equipped with 100-foot-long booms. Concrete was placed 6 feet 7 7/16 inches thick at the base and narrowed to 5 feet at the crown.

Bulkhead panel sections for each of four 60-degree forming sections measured 3×5 feet. Twelve sections were required for each 46-foot-long bulkhead arc.

Two Blaw-Knox 1-cubic-yard-capacity buckets placed concrete at a rate of 60 cubic yards per hour. This concrete was reinforced with 1⅛ to 1½-inch-diameter spiral steel rods. A complete time cycle for setting two 60-degree dome segments took 6½ days. Once the Blaw-Knox forms for the initial two segments were positioned, concrete was poured in 7½ hours and set for 4 days.

Working simultaneously, crews stripped inside and outside surface forms and the bulkhead forms. Screw jacks under two 28-foot-long travelers lowered inside formwork until the rubber tires touched the concrete slab. Inside forms were stripped. The travelers' rubber wheels were set at an angle to allow the forms to go around to the next pour. In position, the jacks were raised again to reposition the forms. This took 12 hours. Cranes stripped and repositioned outside surface and bulkhead forms in four hours.

After the last of three 120-degree concrete pours, outside forms were removed for the last time. Then, inside surface forms and related framework, the travelers, and falsework for the central compression ring were disassembled and removed, in less than three days, through the 6×8-foot doorway for personnel. In all, it took 48 days to complete each dome. THE END



Constructing a heavy-duty wearing surface of hot-mix Texaco Asphaltic Concrete on State Highway 12 in Dudley, Mass. The Bayer and Mingolla Construction Co., Worcester, Mass. did the work.

The speed with which heavy-duty Texaco Asphalt paving is laid and opened to traffic is important. It is important to the engineer and the contractor, since it means earlier completion of the project. It is important to the motoring public, since the highway or street is made available to it sooner.

More important than speed of construction, of course, are several other advantages of heavy-duty Texaco Asphalt paving—the rugged durability of this flexible type of construction—its substantially lower cost compared to rigid paving—its low maintenance cost.

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Bird's-eye view of portion of exhibit plaza during Road Show. The lighter-colored machines grouped in rectangle at left are part of the Caterpillar exhibit. The darker-colored units to the right are some of International Harvester's line of equipment.

An artistic backdrop for the road-building machinery is the brightly colored mosaic wall of the SCOP building (Secretary of Communications and Public Works) where the International Road Federation conference held its working sessions. The meeting ran one week, the Road Show two weeks.

Clark Equipment Co. exhibited units of its Michigan and Ross lines. Here are a 75A front-end loader and a 210 motor scraper, both Michigan products.

South of the border at the

MEXICAN ROAD SHOW

Mexico City, Oct. 27-Nov. 9

Sponsored by Mexican Highway Association and Association of Machinery Distributors

The Lima excavator and Austin-Western motor grader are shown by the Construction Equipment Division of Baldwin-Lima-Hamilton Corp.

New Curtiss-Wright motor scrapers are looked over by Road Show visitors. In front of the CW-27 and CW-215 dirt movers is a display of Mercedes-Benz engines.

Mexican distributor, Maquinaria Intercontinental, displays its Barber-Greene line of ditchers and bituminous mixing plants.

(Additional photos of the Road Show on pages 108 and 109)

nternational Road Federation olds third world conference

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highway association
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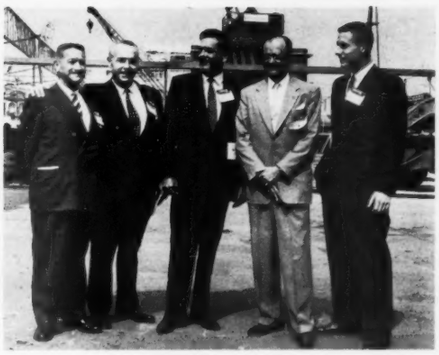

At the Road Show left to right: Jorge Garcia Tellez, Colombia; William H. Schulie, New York City; Tomas Guardia, Jr., Panama; Jose J. March, Mexico; William H. Schulie, Jr., Cincinnati, Ohio.

by WILLIAM H. QUIRK, editor

From 45 nations throughout the world, 681 delegates registered in Mexico City, October 26 to 31, to attend the third world meeting of the International Road Federation, a nonprofit organization established in 1948 to encourage the development and improvement of highways and highway transportation. IRF has offices in Washington, London, and Paris. Previous meetings of this international group were held in Washington in 1952 and in Rome in 1955. At present, national road associations from 64 countries are affiliated with IRF.

The third IRF conference held its opening session on Sunday, October 26, in Mexico City's Palace of Fine Arts. H. S. Merriman of New York City, chairman of the IRF board of directors, presided. He is with Socony Mobil Oil Co. Romulo O'Farrill, Sr., president of the Mexican Highway Association and a Mexican newspaper publisher, welcomed the delegates. He told the assemblage that the Mexican highway network, launched in 1925, now consists of 90,000 kilometers (55,800 miles), of which 45,320 kilometers (28,098 miles) are hard-surfaced, all-weather roads.

Frank T. Magennis, a director and immediate past president of IRF, thanked the Mexican government and people for their cooperation in making the convention a success. Magennis, president of Goodyear International Corp., made his address in Spanish.

Working sessions during the remainder of the week's meeting were held in the building of the Secretariat of Communication and Public Works (SCOP). Papers and discussions covered for the most part these three topics:

1. Economic and social aspects of roads and road transport.
2. Modern methods of road financing.
3. Technical training and technical aspects of roads and road transport.

Road Show

In the plaza adjoining the SCOP building, the Mexican Highway Association and the Association of Machinery Distributors sponsored the largest display of road-building and maintenance equipment in the history of Latin America. It was the greatest outdoor exhibit of highway machinery since 1948, when the American

(Continued on next page)

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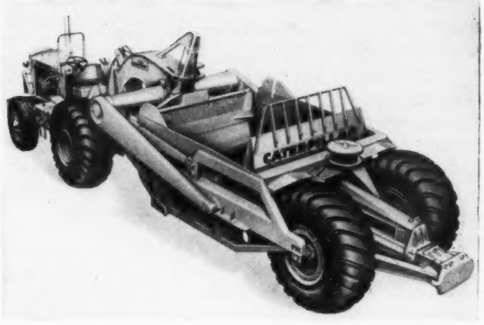

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Additional facts about the No. 482

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Hands across the sea—B. A. Dutton, Standard Oil (N. J.) executive, and Andre Rumpler, president of the Permanent International Association of Road Congresses, and Director of the Department of Roads and Bridges, France.

(*Continued from preceding page*)

Road Builders' Association put on a Road Show at Soldier Field in Chicago. The Mexican road-machinery exposition ran from October 26 to November 9, and was represented by 84 exhibitors, which included manufacturers, distributors, suppliers, and exporters. Equipment was manufactured in the United States, Mexico, Canada, England, Germany, and Sweden. The total display was valued at $5½ million and covered an area of 2½ acres. Illuminated by 120 floodlight towers, the exhibition plaza was open each night until 10 p.m.

All continents represented

As expected, the host state Mexico led the way in delegates registered, with a total of 199; the United States was a close second, having 175 representatives on hand for the meeting. Colombia was in third place with 38 in attendance, followed by Canada with 29. Delegates came from 19 Latin American countries and from 12 countries in Europe. The remaining representatives from the 45 nations cited came from Australia and from various parts of Asia and Africa. It was a true international gathering.

Official languages of the conference were English, Spanish, and French. The auditorium in SCOP, where the working sessions were held, was equipped with soundproof booths for the translators. Each seat was wired for sound and had a pair of earphones and a selector switch by which a delegate might choose the language he wished to hear. Some 50 papers were prepared in advance of the conference so that delegates might have the opportunity to review them for possible comment during the working sessions.

At the initial session covering "Economic and social aspects of roads and road transport", C. T. Brunner, vice chairman, IRF (London office), presided. He is a director of Shell-Mex and B. P. Ltd., and also of the National Benzole Company Ltd. Brunner stated that "because of the great benefits that flow from them, roads should be accorded a higher priority amongst capital projects than is usually the case at present". He then cited numerous examples of the benefits of roads in both developed and underdeveloped countries.

He also discussed the international organizations which finance economic growth, such as the World Bank, the Export-Import Bank, and the Colonial Development Corporation. These institutions want to be sure their loans are protected, Brunner pointed out, and it is the duty of IRF to insure that sound road investment plans are presented when asking for loans. One drawback to road development, he warned, is a lack of basic data to prove economic benefits. He urged an increased exchange of information between the national good-roads associations affiliated with IRF.

"In this way," he said, "International Road Federation should be able to do more as a kind of library and clearinghouse for the experience of individual countries, and to build up an international fund of experience to be used and drawn upon by its affiliates and perhaps other international organizations."

SECOND LARGEST DAM IN THE U. S., at Glen Canyon, Ariz., will incorporate two of these 2,800 ft. diversion tunnels. Frazier-Davis equipment runs dependably, stays on the job, thanks to the Texaco Simplified Lubrication Plan.

Glen Canyon tunnel borings nearing completion with Texaco Plan

Only 6 lubes needed to keep Frazier-Davis equipment working dependably

This is Frazier-Davis Construction Company's job: to bore the east side diversion and service tunnels, with a combined length of 2½ miles, through the walls of Arizona's Glen Canyon. It's a vital project, part of the Bureau of Reclamation's $760 million development of 10,000 square miles of arid land. On a job as big as the Glen Canyon Dam, on-time completion of every phase is absolutely essential. And that puts a priority on dependable equipment performance.

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Texaco Regal Oil R&O—prevents formation of rust and harmful deposits in compressor systems.

Texaco Universal Gear Lubricant EP—keeps differentials and transmissions running smoothly at low cost.

Road financing

The second working session topic, "Modern methods of road financing", produced probably the only real controversy during the meeting. Julien R. Steelman, president of both the American Road Builders' Association and the Koehring Co., Milwaukee, Wis., credited toll roads with a significant contribution in the eastern part of the United States where the major portion of such highways has been built. He stated that toll-road financing hastened the construction of badly needed improvements in certain areas, but that other areas achieved progress without resorting to the construction of toll roads.

Moreover, he continued, "under current practices the federal and state highway programs are supported by special taxes levied on the road user . . . toll financing can no longer be counted on to finance any appreciable new mileage. Improvement of local roads is still supported to a considerable extent by property taxes. No material change in this method of financing highway improvements in the United States is anticipated in the near future."

Chief of the Cuban delegation, Ignacio Fernandez, claimed that toll roads had contributed greatly to the development of a highway system in his country, and urged the IRF to pass a resolution endorsing toll roads as a means of financing highway construction. Russell Singer, executive vice president of the American Automobile Association, opposed such an endorsement and argued that the car user is now paying more than his just share for highway construction through taxes on gasoline, oil, tires, accessories, etc.

Robert P. McKenrick, executive vice president of CIMA, tells of new developments in road machinery.

Andre Rumpler, president of the Permanent International Association of Road Congresses and Director of the Department of Roads and Bridges, France, pointed out that the French highway system could not have been developed without resorting to toll roads. C. R. Nixon of the British Society of Motor Manufacturers and Traders stated that toll roads would never be acceptable in England, where highway systems are financed from the general tax funds. General secretary of the Swiss Road Federation, Dr. Alfred Raaflaub, suggested that the convention adopt an attitude of moderation and cautioned against a hastily adopted resolution. Roberto Martinez Ordonez, minister of communications and public works, Honduras, declared that the opinion of small countries should be considered, that each be left to its own methods of financing, and that no resolutions be passed that would impose a hardship on any member.

Technical training

Under the broad topic, "Technical training and technical aspects of roads and road transport," several

(*Continued on page 11*)

Bureau of Reclamation Photos

Bertram D. Tallamy, U. S. Federal Highway Administrator, praises Central American countries for their work on the Inter-American Highway.

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(Continued from page 9)

papers were presented. Luis Bracomontes, Mexican assistant secretary of communications and public works, asserted that his country suffers from a lack of technical personnel. Mexico needs many more engineers than it has at the present time, according to the assistant secretary, and by 1963 it will need 5,750 more.

Jorge Garcia Tellez, representative of Colombia on the Darien Subcommittee, discussed the construction of the Darien Gap highway through a dense jungle area between Panama and Colombia, unexplored by white men until two years ago. At that time, Garcia and Tomas Guardia, Jr., executive director of the Darien Subcommittee, surveyed a 300-mile route through the gap for one of the last links of the Pan-American highway. Garcia stated that the road could be built in from five to seven years if adequate financing could be obtained.

"The progress of highways and construction equipment" was the topic of a paper by Robert P. McKenrick, executive vice president of the Construction Industry Manufacturers Association, U.S.A. McKenrick discussed the latest developments in road machinery, and pointed out the considerable investment that contractors must make in equipment in order to handle a project efficiently. According to the CIMA executive:

"The annual volume of work undertaken by a contractor will have a great influence on the ratio of equipment investment to the completed work. A contractor whose annual construction volume is $5 million or more will require only an approximate investment of 22.5 per cent in equipment at new prices for the value of his completed highway contracts. An equipment investment of 49 per cent would be necessary if the contractor's annual volume is between $500,000 and $1 million, whereas a contractor whose annual volume is only $250,000 or less will require, at new prices, an approximate investment of 111 per cent of his completed highway contracts for the construction machinery and equipment involved."

Bertram D. Tallamy, U. S. Federal Highway Administrator, called attention to an example of harmonious international cooperation toward a mutually beneficial goal in the Inter-American Highway, which is being pushed to completion by the United States and the countries of Guatemala, El Salvador, Honduras, Nicaragua, Costa Rica, and Panama. "Mexico has already completed its 1,600-mile section of this highway", Tallamy said. "This great travel artery will be the first through road to join the temperate and tropical zones in the world, making possible a freer interchange of people and products of the various countries, and further cementing their solidarity."

On Thursday, October 30, 12 busloads of delegates and wives visited El Olivar operators and mechanics training center in Mexico City, and

(Continued on next page)

M. D. Morris, Testlab veep, demonstrates laboratory testing equipment to a group of Mexican government engineers. A Seaman-Andwall compactor can be seen in the background.

Rocky Road Ahead?

You can do more for less on Tru-Seal Tubeless Rims

You couldn't pick a tougher test than working into and hauling jagged, newly blasted rock. On jobs like this, you'll get lower cost-per-ton when your tires are mounted on Tru-Seal Tubeless Rims by Goodyear.

Tru-Seal is the only practical way to seal a multiple-piece rim. In fact, it has been adopted by the Tire and Rim Industry for tubeless replacement of all conventional tire sizes 12:00 and larger.

Like all Goodyear Rims, Tru-Seal offers these additional advantages:

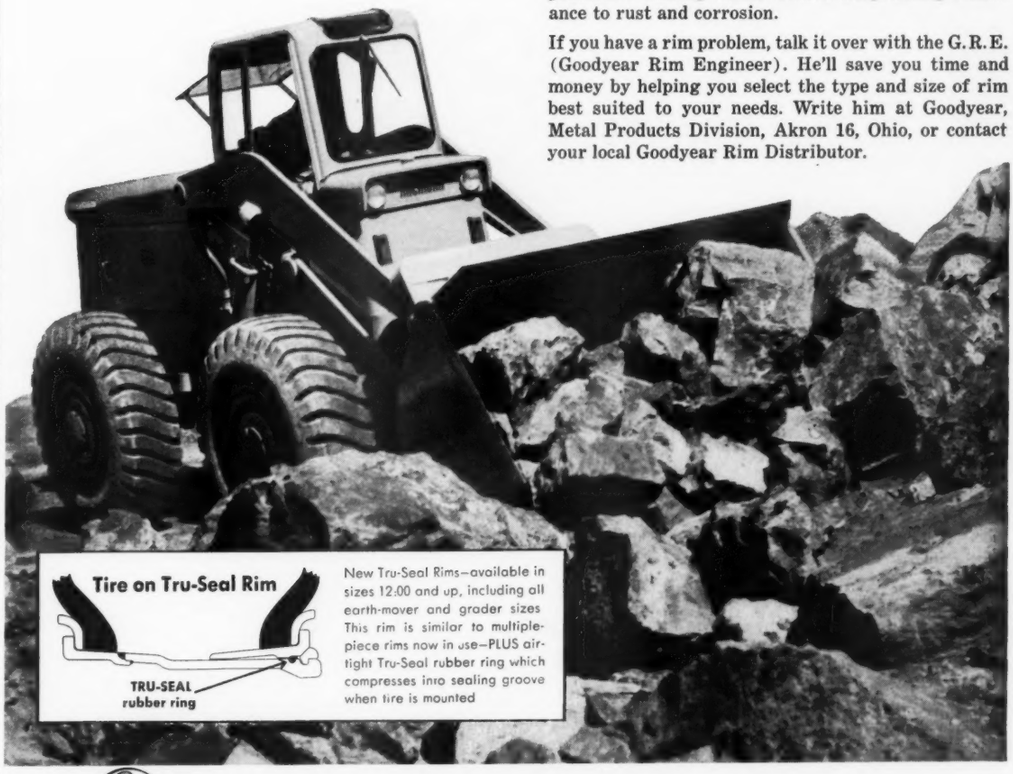
Unusual Strength: Thanks to an exclusive double-welding process, and added support at points of greatest stress, present-day Goodyear Rims are far stronger than previous rims.

Ease of Tire Mounting: No tube and flap troubles.

Special Tools: Goodyear provides both hydraulic and hand tools especially made for off-the-road equipment.

Bond-a-Coat Finish: Only Goodyear Rims have this protective coating which affords long-lasting resistance to rust and corrosion.

If you have a rim problem, talk it over with the G.R.E. (Goodyear Rim Engineer). He'll save you time and money by helping you select the type and size of rim best suited to your needs. Write him at Goodyear, Metal Products Division, Akron 16, Ohio, or contact your local Goodyear Rim Distributor.



New Tru-Seal Rims—available in sizes 12:00 and up, including all earth-mover and grader sizes. This rim is similar to multiple-piece rims now in use—PLUS air-tight Tru-Seal rubber ring which compresses into sealing groove when tire is mounted

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Buy and Specify **GOODYEAR**

More tons are carried on Goodyear Rims than on any other kind

METAL PRODUCTS DIVISION

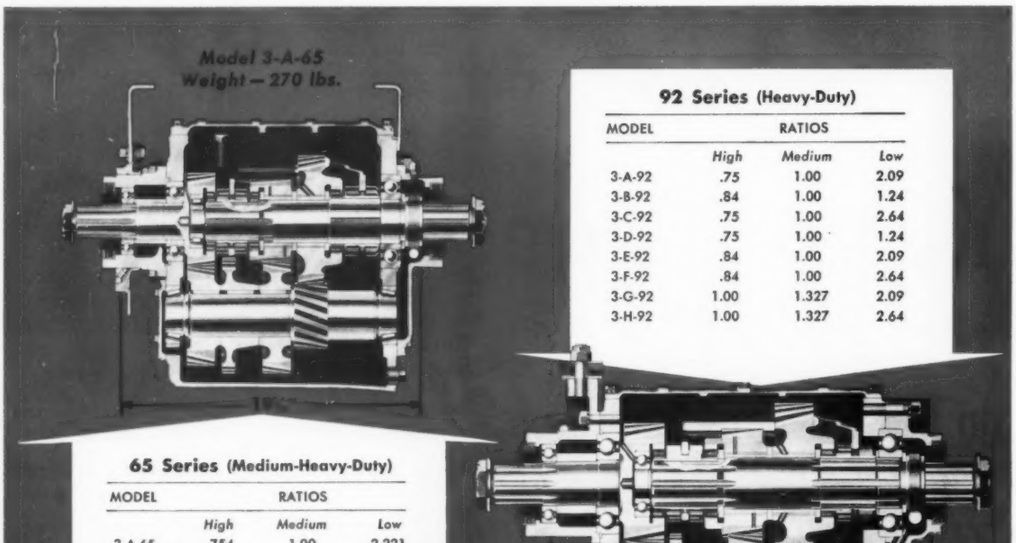
Tru-Seal—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

Watch "Goodyear Theater" on TV—every other Monday, 9:30 P.M., E.S.T.

For more facts, use Request Card at page 18 and circle No. 206

At the Clipper ConSawMatic exhibition, Laurance V. Michaux, export sales manager, directs the self-propelled concrete saw for the benefit of equipment distributor Bernardo A. Clapier. That's a LeTourneau-Westinghouse scraper right behind.

Thomas J. McNeill of Soiltest, Inc., uses a slapboard as a visual aid in discussing mobile testing laboratories.



92 Series (Heavy-Duty)

MODEL	RATIOS		
	High	*Medium*	*Low*
3-A-92	.75	1.00	2.09
3-B-92	.84	1.00	1.24
3-C-92	.75	1.00	2.64
3-D-92	.75	1.00	1.24
3-E-92	.84	1.00	2.09
3-F-92	.84	1.00	2.64
3-G-92	1.00	1.327	2.09
3-H-92	1.00	1.327	2.64

65 Series (Medium-Heavy-Duty)

MODEL	RATIOS		
	High	*Medium*	*Low*
3-A-65	.754	1.00	2.221
3-B-65	.804	1.00	1.239
3-C-65	.754	1.00	1.239
3-D-65	.804	1.00	2.221
3-E-65	.804	1.00	1.74
3-F-65	.754	1.00	1.74
3-G-65	1.00	1.32	2.221
3-H-65	1.00	1.32	1.74

Now ...the most complete line of 3-speed AUXILIARY Transmissions

The Fuller Manufacturing Company now offers the most complete line of three-speed auxiliary transmissions . . . for transport, logging, construction, mining and crane carrier services . . . at lower prices than competitive units in a comparative capacity range.

The extremely rugged heavy-duty 92 Series has been completed by the addition of 5 new sets of gear ratios, Models 3-D-92 through 3-H-92. Four new sets of gear ratios, Models 3-E-65 through 3-H-65 have been added to the medium heavy-duty 65 Series.

Split Gears and GO

The expanded line of three-speed auxiliary units includes splitting ratios, both underdrive and overdrive. With these splitting ratios, the engine can operate at maximum horsepower through a full range of vehicle speeds. Ideal for over-highway operation, the extra gears allow faster schedules, greater profits.

Deep Reductions

Deep reductions, in combination with splitting ratios, offer maximum flexibility both on and off-highway where the deep reduction is required for extreme grades and soft footing, and where splitting efficiency is required for traffic conditions.

Longer Equipment Life

With engines working in the most efficient torque and horse-power range, there is less lugging . . . less wear . . . and greater fuel economy. Result: lower maintenance costs, less downtime, longer engine and transmission life.

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FULLER MANUFACTURING CO. Transmission Division • Kalamazoo, Mich.
Subsidiary, Eaton Manufacturing Company

Unit Drop Forge Div., Milwaukee 1, Wis. • Shuler Axle Co., Louisville, Ky. (Subsidiary) • Sales & Service, All Products, West. Dist. Branch, Oakland 6, Cal. and Southwest Dist. Office, Tulsa 3, Okla.
For more facts, use Request Card at page 18 and circle No. 207

(Continued from preceding page)

then drove over the Mexico City-Cuernavaca Expressway, a 4-lane, 59-mile-long toll road.

Resolutions

Several resolutions were passed at this third world meeting of the IRF. The conference went on record as favoring adequate road systems constructed with the most modern methods to insure a maximum of safety by reducing the number of accidents and accident victims. It called for more urban motorways with fully controlled access. It urged economic investigations to strengthen the case for expenditures on road work. Long-term financing programs were recommended.

The controversial toll-road financing question was resolved in the following section: "In order to accelerate the completion of road programs, consideration may be given to the following: providing no fiscal income specifically derived from road traffic is diverted for other means than covering road costs financed by private capital, tolls may be charged on road sections where particularly costly works are necessary, such as tunnels, bridges, etc. Such sections, however, must as soon as possible become free facilities. That, in those instances where traffic conditions do not permit the recovery of the investment solely by means of toll charges, the deficit may be made good by the imposition of a tax on the properties which have benefited directly from the facility or by means of an allocation from the ordinary budget."

It was also recommended that the IRF and its affiliated road associations investigate means available for publication of a "Dictionary of Highway Terms" in Spanish, English, Italian, French, and German; and that the proposal for such an undertaking be submitted to the United Nations Organization or other similar organization. Also that IRF investigate the possibility of publishing texts to be translated from English to Spanish on highway and traffic engineering and related materials that would be suitable for Spanish-speaking countries. THE END

Armco opens new terminal for steel products

A $1½ million terminal on the Ohio River has been opened by the Ashland, Ky., Works of Armco Steel Corp., Middletown, Ohio. The terminal will handle hot and cold-rolled steel sheets and coils, and special coated steels. The 100×248-foot structure has facilities for trucks and railroad cars and can unload or load two to three barges per day.

Rising 70 feet out of the water at pool stage, nine concrete-filled steel piers provide docking space for 13 barges. Two larger piers support the terminal building, and another is located upstream to serve as an ice-breaker. The facility is designed for year-round operations and is equipped with floodlights so that activities can be carried on 24 hours per day.

HRB bulletin lists books on vehicle fumes, noise

"Selected Bibliographies on Vehicle Noise and Fumes", Bibliography 22, is available for 50 cents from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

A brief outline on the problems of vehicle noise and fumes precedes the bibliography on each. There are 42 books and bulletins listed on vehicle noise, and 34 on vehicle fumes.

B-E names sales manager

Howard Freyensee is the new manager of sales for large excavators manufactured by the Bucyrus-Erie Co., South Milwaukee, Wis. He succeeds L. C. Black, who has been named manager of domestic sales. Freyensee was formerly sales development manager of commercial cranes and excavators.

Reo Division appoints

Orville J. Hoag has been appointed field sales coordinator for the Reo Division, The White Motor Co., Lansing, Mich. He will serve Reo's field organization in such areas as sales education, sales penetration analysis, sales promotion, and fleet sales solicitation. Hoag will also assist in distributor expansion.

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Let WIX *team-up* with your maintenance section to give you Prescription Filtration that stops costly engine failures and reduces construction equipment down time. WIX Lube, Fuel, and Air Filter Cartridges keep damaging dirt, grit, and sludge out of vital engine areas. Install WIX HEVI-DUTY Cartridges in *all* your filters for this money-saving trouble-free ℞ filtration. They're made especially to stand up under tough operating conditions and work schedules.

WIX *teamwork* includes a FREE Filter Survey that lists every one of your engines with its correct lube, fuel, or air filter Cartridge replacement. And, your local WIX Wholesaler will stock a reserve supply of the particular Cartridges you need—one convenient source for fast filter service.

Prescription Filtration

WIX Filter Cartridges are engineered specifically for every engine in construction service ... gasoline or Diesel—mobile or stationary—for lube, fuel, and air.

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INTERNATIONAL
LE TOURNEAU • MURPHY
ALLIS-CHALMERS
and ALL OTHER
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For more facts, use Request Card at page 18 and circle No. 208

by D. R. GRAHAM, waterworks engineer
and N. L. IVERSON, P. F. R. A., soil mechanics engineer,
Saskatoon, Saskatchewan, Canada

Changes in tunneling methods facilitate storm-sewer job

The biggest difficulty in tunneling the 14th Street storm sewer in east Saskatoon, Saskatchewan, Canada, was caused by the nature of the soil itself.

The new storm sewer serves an 800-acre area that has no natural surface drainage, despite its nearness to the South Saskatchewan River. Tunneling for 3,200 feet insured that surface traffic and shallow sanitary-sewer and water services would be disturbed as little as possible.

But when work got under way, tunneling methods went from conventional hand excavation to work with shields, and crews resorted to freezing, poling plates, electro-osmosis, grouting from the surface, and chemical solidification to overcome the difficult soil conditions.

Soil conditions

Tests showed this area to be a dense glacial till, overlaid by alluvial deposits that were extremely variable in nature and depth. Generally, they consist of a layer of fine silty sand, up to 40 feet thick, overlying a firm blue clay of medium to high plasticity. The depth of the sand varies greatly; even within short distances the slope between sand and clay is on a 1 to 1 gradient.

The water table is generally 15 to 25 feet below the surface, and though seepage in sand excavations below the water table is not great, it usually causes sand to cave or run. Even the glacial till underlying the alluvial clay has frequent layers of fine to coarse water-bearing sand.

The required depth of the Saskatoon tunnel was less than 50 feet from the surface but, because of these conditions, it was decided to go about 50 feet below the surface in hopes of avoiding sand for most of the tunnel length.

Hand excavation

To provide more working room, 60-inch 10-gage Armco tunnel liner plate, rather than 54-inch liner, was used. Work started with conventional hand-tunneling methods. As the blue clay was dug with an air spade, the material was transported to the portal in hand-pushed buggies riding tracks installed on the tunnel invert.

Progress for the first 740 feet was excellent. About three rings, or 4½ feet of liner, were installed per 8-hour shift. But trouble was encountered, and work stopped one weekend. When crews returned on Monday, they found the tunnel completely filled with sand, water, and clay for a distance of 12 feet from the face, and partially filled for a distance of 60 feet beyond that. The clay cover apparently gave way, allowing the water-bearing sand to pour in.

Partial bulkheads were used to stop the flow of silt into the tunnel, and removal of the sand, silt, water, and chunks of alluvial clay started immediately. But little progress was made with this method; the tunnel was bulkheaded off and a shaft started a few feet beyond its face. A cavity 18 feet deep and 12 feet in diameter was found immediately below the frost line.

(Continued on page 16)

with DENISON hydraulic equipment...
CATERPILLAR did!

2000 PSI HYDRAULIC POWER
...for operating Caterpillar's rugged No. 9 Ripper is delivered by a single Denison "T" series vane pump. Payoff: jobs get done with troublefree power to spare for toughest workloads.

• Why? Because dependable 2000 psi Denison hydraulic power helps Caterpillar build *lower operating cost* and continuous, *troublefree performance* into its rugged earth-moving units.

Case in point: Here's Caterpillar's No. 9 Ripper — another of many construction units to be factory-equipped with Denison hydraulic equipment. The Ripper's hardworking teeth are *powered by a single Denison vane-type pump* which provides plenty of reserve "go" for toughest workloads.

Plus benefits: All-weather pump starting without pump damage . . . speedy field servicing . . . less weight . . . less cost-per-horsepower—with a Denison pump as the heart of a hydraulic system.

Caterpillar picks Denison hydraulic equipment for reliability . . . quality . . . proven field performance. It pays off in helping keep Cat® units operating continuously . . . *profitably* month after month.

It's the kind of job your Denison Hydraulic Specialist can help *you* do now. Ask him more about how Denison hydraulic power . . . up to 5000 psi . . . can *improve performance of your equipment.*

DESIGNERS—ENGINEERS!
Write for your copy of Bulletins 200 and 201—"How to Design More Efficient Hydraulic Power Into Mobile Machinery" and "Balanced Vane 2000 psi Hydraulic Pumps".

DENISON ENGINEERING DIVISION
American Brake Shoe Co.
1262 Dublin Road • Columbus 16, Ohio

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HYDRAULIC PRESSES • PUMPS • MOTORS • CONTROLS

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The Huber-Warco 5D-190 blades down a fill on Wisconsin's new Hudson-Eau Claire Road.

Huber-Warco on the job

There's one grader on the job
handling all of the grading jobs,
but it's a man-sized 5D-190,
the world's most powerful.

Gerke gives 5D-190 a tough assignment

Lawrence Gerke, a contractor in Merrill, Wisconsin, was awarded one of the first contracts on the new Hudson-Eau Claire Road. This important road in the Wisconsin Interstate System will run from the Minnesota state line to the Illinois Toll Road.

Chosen to handle all of the grading assignments in this rugged area was a Huber-Warco 5D-190, the world's most powerful motor grader. This terrain was just the ticket for the 5D-190 that combines a 195 h.p. diesel engine, torque converter and power shift transmission.

In handling this job, Gerke will move over one million yards of dirt, and 300,000 yards of rock. There are eight major cuts with the maximum 115 feet, and five major fills with the biggest being 70 feet.

The 5D-190's assignment . . . build and maintain the haul roads, cut all the ditches, and work on the slopes after the cuts and fills are completed. This machine will also spread the 9" lift of granular sub-base, and then after all the paving is completed the unit will spread top soil over the excavated area before seeding.

"We needed a grader that could do a man-sized job in keeping the haul roads clear and leveling off the fills," said Paul Potts, the grade foreman on the job. He continued, "that's a big order for one machine but the powerful 5D-190 is doing a good job. It's a very dependable grader and we're well pleased."

There are three major haul roads on this job with the average haul being 1,000 feet.

Constant travel by the nine pans and trucks really chew up the roads. The 5D-190 keeps these roads smooth, and keeps the haul loads moving on schedule up the steep inclines.

Smooth haul roads are also easier on tires, and with tire costs of up to $4500.00 each, the elimination of ruts and sharp rocks on the roads mean longer tire life . . . an important cost factor on jobs.

The man-sized, work-producing features of the powerful, efficient Huber-Warco 5D-190 motor grader have been important to many contractors on projects throughout the world. Let your Huber-Warco distributor show you what these features can mean to you on your jobs.

Haul units move on schedule as the 5D-190 smooths out ruts and removes sharp rocks from the haul road.

Huber-Warco Company

MARION, OHIO

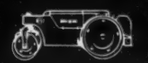
Terms up to 36 months and rentals available . . . contact your Huber-Warco distributor.

HUBER WARCO

TANDEM ROLLERS

MOTOR GRADERS

MAINTAINER


3-WHEEL ROLLERS

For more facts, use Request Card at page 18 and circle No. 210

Chunks of blue clay are brought to the portal of the 14th Street sewer in east Saskatoon, Saskatchewan, Canada, on a hand-pushed buggy that rides tracks on the tunnel invert. The tunnel liner is Armco 60-inch 10-gage liner plate.

so that buggies could be brought up and dumped. At the same time, a high-pressure air-operated grout pump with a booster feature capable of producing a discharge pressure of 200 psi was designed and built.

By using a combination of grouting and poling plates, crews installed 12 rings, or 18 feet of tunnel, in six weeks. The poling plates gave some protection, but the tunnel face had to be left partly open for some time while the poling plates were manipulated. Grout also was an obstacle to advancing the plates; even so, the grouting procedure worked better than had been expected, despite the fineness of the sand and silt. Under sufficient pressure, the grout forced its way into the sand in sheets and provided some overhead support.

Since the amount of water flowing into the tunnel was never a serious problem if crews could cope with the pressure head, it was finally decided to abandon the poling plates and proceed with pressure grouting alone. After a considerable amount of grouting had been done, it was possible to remove the jacking heads and abandon the poling plates, which, by this time, were badly bent from being jacked through the grouted material.

Grouting alone

Grouting was done with a cement-sand-sawdust mixture of 1:2:2 in combination with a small amount of bentonite. With plenty of pressure applied, this mixture was forced into the silt, where it remained stable from five to ten hours. Then the ma-

(*Continued from page 14*)

The shaft was then completed and excavation again started in the tunnel, but it was evident that a different method had to be devised.

Freezing method

An attempt was made to freeze a horizontal curtain over the tunnel face by using dry ice in 2-inch pipes that were 6 feet long and spaced on 12-inch centers above the tunnel. But this method was slow. About 36 hours' freezing time was required, and after two rings had been installed, further attempts at freezing were unsuccessful. This was probably because even a small movement of ground water toward the tunnel face reduced the effectiveness of the freezing.

Use of poling plates and grout

Next, an attempt was made to support the silt by jacking sheet piling horizontally about three feet above the tunnel face. But the fluid nature of the silt made this method useless.

Even though pressure grouting is usually not successful with silt and very fine sand—because the grout will not penetrate the voids in the material—it was attempted here in the hope that the grout would fill some of the voids left by the caving material. A converted steam pump, driven by compressed air, was used to place the cement-sand mixture of 1 part cement to 2 parts sand and 4 per cent bentonite.

Though progress was made, the method did not seem promising and it was dropped. (At this time, the value of high pressures and the need for continuing to grout until pressure became effective was not realized.)

After consultation with Armco representatives, it was decided to use interlocking steel poling plates, 5 feet long, over the top of the tunnel. Throughout tunneling operations, C. Fisher of Armco Drainage & Metal Products, Ltd., provided much helpful advice and assistance. A 50-ton-capacity power-operated hydraulic jack, mounted on a 4-wheel carriage, was built to press the poling plates forward as the tunnel advanced. A power hoist was installed at the shaft

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GMC is really rolling with the biggest engineering, design and quality-control program the industry has ever known! You can see the results in today's GMC Trucks —toughest, most dependable, most economical trucks ever built!

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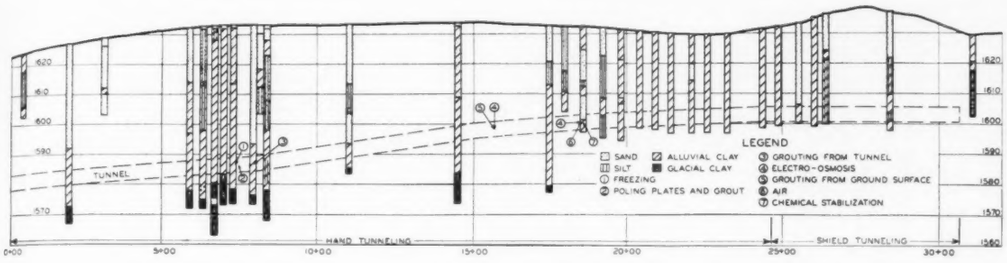


terial would get wet, begin to spall in large pieces, and finally start to squeeze into the tunnel. If bulkheading was not installed at this stage, it was invariably followed by a rush of silt and water under a considerable amount of pressure. This could not be controlled until the tunnel was completely filled for some 30 feet back from the face and partly filled for a much greater distance. It occurred a few times until experience indicated when to stop excavation, bulkhead the face, and regrout.

One objectionable feature of this method was that it subjected the bulkhead to very high pressures that distorted the tunnel liner and made grade and bearing difficult to control. Wherever silt pockets were overcome with pressure grouting, compensations had to be made for both grade and bearing. Despite this drawback, the method worked well, and 59 rings were installed, extending the tunnel 88½ feet and through the silt pocket.

Only one silt pocket was encountered in the next 700 feet of tunnel, and this was stabilized with a single grouting.

Splinter boards

A semicircular shield, constructed by driving 3 or 4-foot lengths of 2 × 4's, proved very useful where loose or spalling clay was encountered and where hydrostatic pressure was low. A levering tool was made to lift the heel of these boards up and pull them back so that the ends rested on the perimeter of the tunnel liner. When properly placed, these did not interfere with the installation of the liner-plate sections and fairly rapid progress was made.

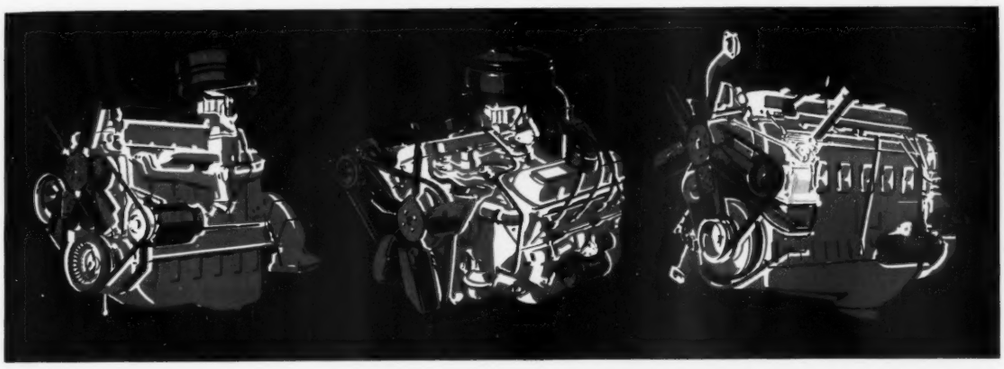
Electro-osmosis

When another bad silt pocket was encountered, electro-osmosis was used as a cheaper and faster method of control. The pocket extended for about 80 feet. Four cathodes were put down from the surface about 20 feet ahead of the tunnel face. The tunnel liner was used as an anode, and current from two 500-amp welding generators in series was supplied for four days. But this did not improve conditions at the face of the tunnel, probably because of the coarseness of the unstable material.

Grouting from the surface

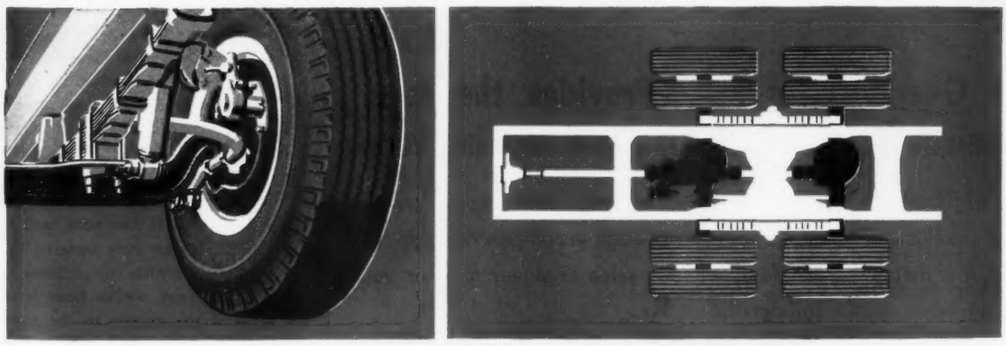
Pressure grouting was again used, but this time the grouting was done from the surface. Two-inch-diameter pipes were put down at 10-foot intervals and grouted. This worked very well, and the tunnel reached station 15 plus 66, with a shaft being put down at station 15 plus 40.

Later, a bad break occurred at station 18 plus 52. At the time of the cave-in, the face of the tunnel was mostly clay; only the upper foot or two was sand. More than 350 bags of cement were used in grouting before any results were obtained. At this point, the surface of the street raised noticeably, and a crack appeared in front of and at right angles to the tunnel. A grout pressure of possibly 100 to 150 psi was being used. The



HIGH-TORQUE 6's, V-8's AND DIESELS TO CHOOSE FROM

You have the finest selection of top-efficiency gasoline and diesel engines—all designed to get maximum payload there on time with less engine wear and tear. For example, a GMC pickup with standard 3.07 fast ratio cruising axle runs at 623 revolutions less per mile. It provides overdrive performance at no extra cost—yet gets there just as fast with far less strain on valves, pistons and bearings.



TOUGH, YET LIGHT, FRONT AND REAR AXLES PERMIT BIGGER PAYLOADS

GMC front axles are designed to let you turn in a shorter radius. Built stronger, too, they have one-piece center beams of heat-treated steel and extra thickness at points of stress. Available on tandems where light weight is a must, aluminum saddles and walking beams, and rubber-cushion suspension cut down weight while maintaining GMC ruggedness.

HAULS OVER 16% MORE READY MIX ON EVERY TRIP

Tailored to ready-mix needs, this GMC FW556 pacesetter outhauls anything on the road . . . carries 7 full yards at a clip within a 46,200 lb. total! On 1,000 cubic yard jobs it saves up to 24 trips! Powered by a mighty 370 cubic inch V-8 engine.

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TRUCKS

From ½-ton to 45-ton
. . . General Motors
leads the way!

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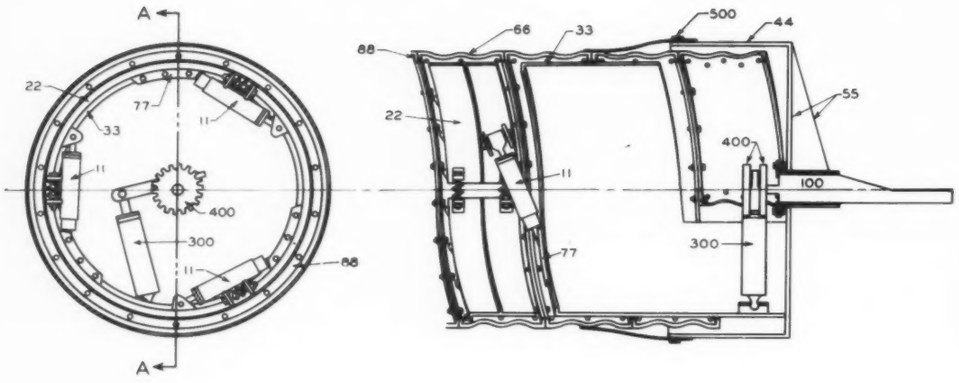

No.	PARTS
11	DRIVING RAMS
22	EXPANDING CIRCULAR SHOE
33	INNER SHELL OF SHIELD
44	OUTER SHELL OF SHIELD
55	CUTTING EDGE OF SHIELD
66	SPIRAL BOLTED LINER PLATE
77	JACK ATTACHMENT TO INNER SHELL
88	LINER PLATE FLANGE
100	STEERING BAR
300	HYDRAULIC RAM
400	REVERSIBLE RATCHET ASSEMBLY
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◄ A cross section of the auger-type shield, which was tried in the last 600 feet of tunnel. This made it possible for the tunnel liner to be bolted in a continuous spiral rather than in concentric rings.

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B - 352

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(Continued from preceding page)

tunnel invert at this point was only about 33 feet below ground surface, and from this point on it was likely that sufficiently high pressures could be developed to effectively grout the sand.

The best methods were a wellpoint vacuum system or the use of compressed air. But these had their drawbacks. Lack of labor and the high expense made the use of compressed air undesirable; the use of a wellpoint system from the ground would require two stages and, consequently, an open cut. This was undesirable because it would interefere with traffic and existing water and sewer services.

The more doubtful methods—electro-osmosis, ordinary gravity wellpoint systems, and chemical soil stabilization—were re-examined for possible use. Electro-osmosis was tried first, since the equipment was already available and it was the least expensive system. The tunnel was made the cathode, and two 1½-inch steel pipes driven into the face of the tunnel for a depth of about 15 feet were used as the anodes. These were covered for the first 10 feet with rubber hose so that the current would flow from the ends of the anodes to the sides of the tunnel. The idea was to aid natural drainage into the tunnel and away from the face. After three days of continuous operation, the face was opened. It was found that some drying had taken place near the anodes, but that the electro-osmotic pressure was not enough to stabilize the silty sand.

Chemical solidification was tried next, a solution of 32 parts water, 7 parts sodium silicate, and 1 part glacial acetic acid being used to produce a firm gel with a setting time of about 30 minutes. This gel, however, did not have enough strength to withstand the head of water above the tunnel. It was often necessary to use air spades to remove grout-hardened sand, and the vibration hastened the rupture of the tunnel face.

A calcium chloride solution was then tried with the sodium silicate solution. These two chemicals react to form a strong crystalline solid. After a number of experiments, it was

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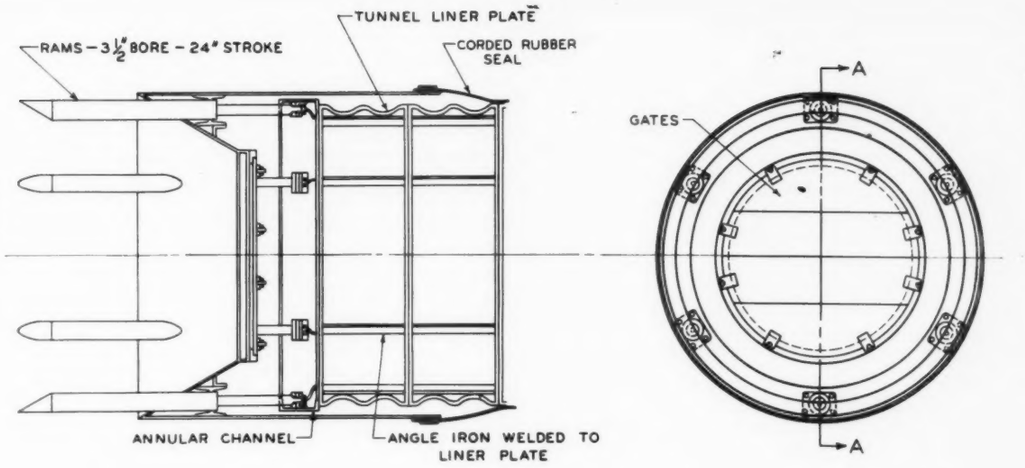


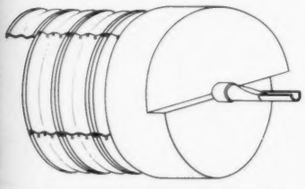
A cross section of the push-type shield with ram, which was used after the seal on the rotating shield failed twice. ►

found that solutions of 10 gallons of sodium silicate to 10 gallons of water and 40 pounds of calcium chloride to 20 gallons of water gave best results. The injection device, constructed on the job, consisted of two small steam pumps connected to a ⅜-inch copper tube inside a ½-inch pointed pipe. Holes near the point allowed chemicals to mix as they reached the discharge end. A small jet of compressed air agitated the calcium chloride solution and aided mixing.

This produced good results, although it was expensive. The cost of chemicals alone amounted to $80 per foot of tunnel. But the cost of cement grout often exceeded this, and the amount was not considered extravagant for fairly short stretches of difficult tunneling. However, chemical solidification was too slow to be used as a routine procedure. It was confined to use as an aid in mechanical shield tunneling.

Rotary auger-type shield

The last 600 feet of tunnel was driven with two types of shield. First, a rotary auger-type shield was tried. The idea was to bolt the tunnel liner in a continuous spiral rather than in concentric rings. The shield consisted of a double-bitted auger with an 18-inch lead and 9-inch pitch. The auger was 64 inches in diameter and was rotated by means of three power-operated hydraulic jacks with 3-inch bores and 12-inch strokes set tangentially and spaced at 120-degree



A drawing of the auger-type shield.

intervals on the inner shell of the shield. A continuous expanding shoe, made in three segments, was used to grip the bolt heads in the liner-plate flange. The shaft end of each jack was connected to one segment of the shoe. In this way, an even pressure was exerted on the liner plate when the shield was rotated. A corded rubber seal was used to prevent silt from

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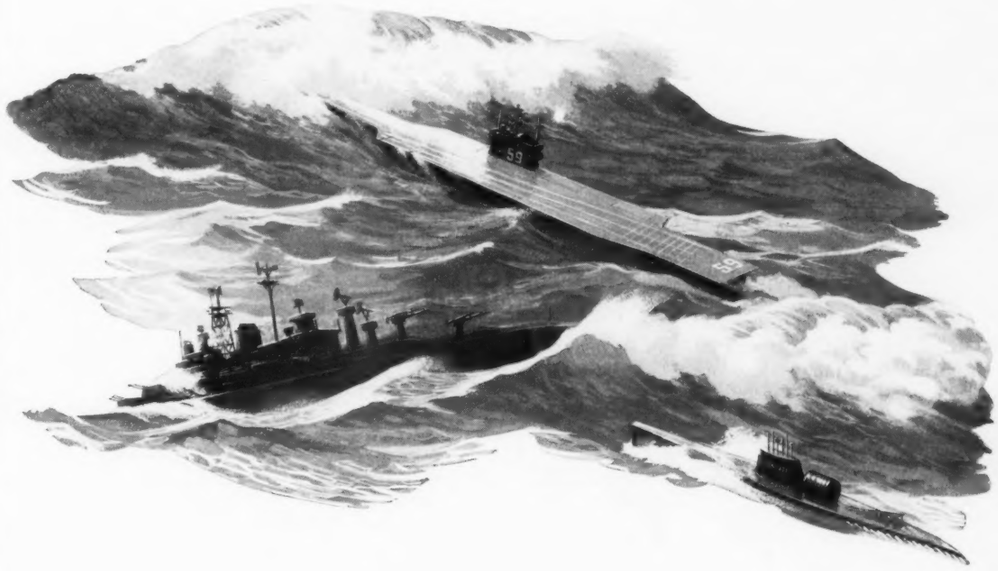
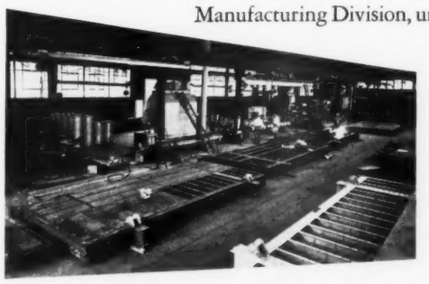


Storms a la carte . . . . . .

The 5-ton wave-generating weldments in the new David W. Taylor Model Basin, Carderock, Maryland, were made by the Butterworth Contract Manufacturing Division, under contract with Blount Brothers Construction Co., Montgomery, Alabama, general contractors.



In addition to testing the seaworthiness of ships, the model basin will also be used to simulate shore conditions and test landing craft. It's a U. S. Navy project.

Shown at left is a Butterworth production bay where the weldments were produced. Big, rugged, yet maximum over-all tolerances of 1/16-inch were maintained throughout as components had to be precisely located in the welding fixture. Machining tolerances on some parts were held to plus or minus .0005".

The modern Butterworth plant and our complete metalworking facilities are available to serve you. Talk to a Butterworth sales-engineer, or write for illustrated booklet, "The Butterworth Story."

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(Continued from preceding page)

flowing in between the shield and tunnel liner.

Steering was controlled by a truncated outer shaft 6 inches in diameter and 5 feet in length. This steering bar could be rotated with the auger when no change in direction was required, or held stationary when a correction was made in grade or bearing. A 3-horsepower 3,600-rpm 220-volt motor, driving a hydraulic pump through a 3:1 speed reducer, powered the shield. A hydraulic pressure of 2,500 psi was used.

Ten segments were placed in an average 8-hour shift, the rate of progress being 3¾ feet as compared to 4½ feet for hand tunneling. Altogether, 235 feet of tunnel was completed with this machine.

Steering problems arose, since the machine tended to rise, but these were overcome by lengthening the steering bar and restricting the flow of earth through the opening on the upcutting side of the machine. Hinged gates were installed at these openings and were made adjustable.

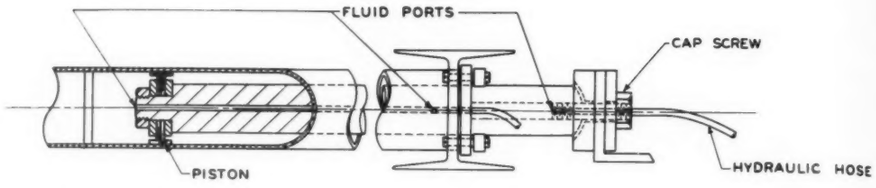
The shoes providing forward thrust gave some trouble, and once or twice they bent the liner-plate flange. But the greatest difficulty was caused by the rubber seal at the back of the shield. After two failures of the seal, this shield was abandoned in favor of a push-type shield. (Since this experience with the rotary auger-type shield, a seal consisting of metal segments hinged at one end and overlapping each other has been evolved. This should effectively solve the seal problem. Specially designed liner plate with correct forward spiral and countersunk threaded nuts should be developed for this type of shield.)

Push-type shield

With the most difficult portion of the tunnel yet to be completed, a push-type shield was designed and built. A single outside shell of ⅜-inch mild steel plate with a corded rubber seal at the rear was used. The front 30-degree cone reduces from the cutting edge of 64 inches to a center opening of 42 inches.

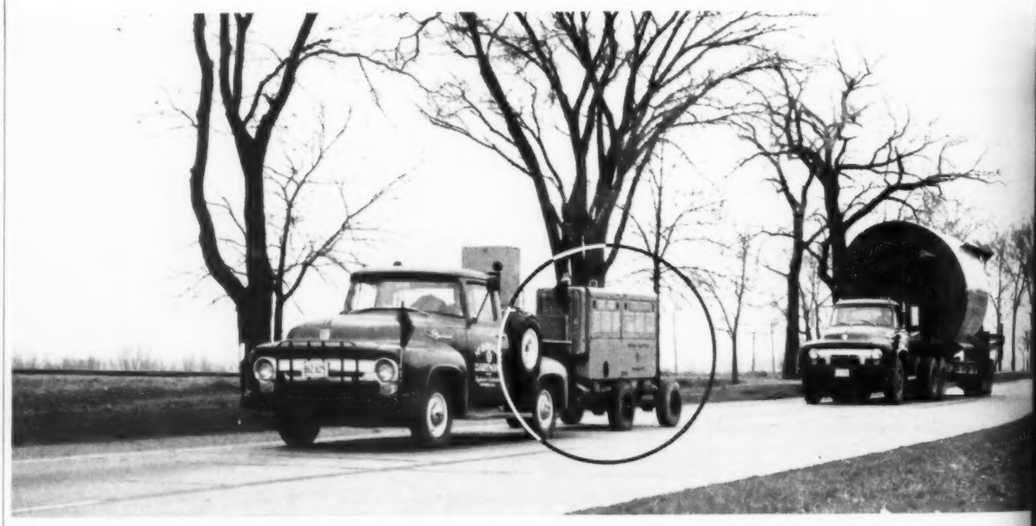
Originally, eight doors, hinged at the center and latched at the periphery by ¾-inch bolts with thumb nuts and slotted tongues, were used. The center bar offered a considerable amount of resistance; it was later removed, and four gates extending across the opening were substituted. This seemed to work much better. Forward motion was provided by six hydraulic rams having a 24-inch stroke and a 3½-inch bore. Hydraulic pressure used was 3,000 psi. An annular channel distributed pressure against the tunnel liner. Shaft ends of the six jacks were connected to this ring by means of sockets that allowed some swivel action.

The liner plate had to be reinforced by 2 × 2 × ⅜-inch angle irons opposite each jacking point to withstand the thrust. This required extra labor and added substantially to the expense. The same power unit used with the rotary auger-type shield was used with this one, but it worked at



A cross section of the hydraulic ram.

Cat power saved these owners $1,300 each



1 McDougal-Hartmann Co.'s, Heltzel Bin Hardy and Johnson Automatic Batching Plant follows their 40 KW Cat D315 Portable Electric Set to its fourth job site. Savings during the first year of ownership while moving them, alone have amounted to $3,900. Operational savings are not even included. The owners estimate that running in and hooking up to public utility power would have averaged at least $1,300 per move. An additional $1,200 was saved at the outset since the Electric Set would operate the plant's higher voltage electric motors which were supplied as original equipment.

2 At a previous job location in Sterling, Illinois, this unit produced 86.4 batches per hour for use on one of the firm's nearby road construction jobs.

Without portable power, it often requires the more common technique of setting up the batch plant along a railroad siding or right-of-way, bringing in materials by rail if the haul distance to the job is not excessive. Concrete specifications in some states limit the haul distance of mixed concrete due to the time element. All in all, Cat portable power saves operating time, cuts costs.

3 Many contracting companies with multi-state ope tions, such as McDougal-Hartmann, require pow portability to avoid the frequent high cost and inconve ience of obtaining power in remote areas.

On their present job it would have necessitated strin ing poles and wire from this power line to the plant lo tion (in the circle). Instead, the highly mobile Cat Elec Set was rolled up alongside the batching plant, hooked up with wall plug simplicity ready to go.

a higher pressure and maintenance became quite costly. A spare unit was kept in readiness to prevent excessive delay in the job.

The seal at the rear of the shield gave some trouble and a considerable amount of leakage occurred, though this was never serious. Steering was also difficult, for the front end of the machine had a tendency to go down. All the earth excavated by the bottom one-third of the cutting edge had to be lifted to pass through the opening, while earth excavated by the top portion of the cutting edge had to be moved down. An attempt to steer by shutting off the oil supply to the top rams resulted in serious loss of power. But this had been foreseen to some extent, and the machine was designed with the rams, projecting about 18 inches through the front end of the machine, terminating in a 30-degree inclined plane. As the body of the ram was rotated, the inclined plane tended to exert radial force on the machine. Bearing and grade were effectively controlled by this means. It also reduced the over-all required length of the shield. Progress with this shield was 4 feet or more per shift and, under favorable conditions, this could probably be increased.

Good use of chemical soil stabilization was made in conjunction with shield tunneling, particularly when the push-type shield was installed. In this operation, a 12-foot-wide and 14-foot-long shaft was sunk 38 feet in wet, fine, running sand. A wood cribbing of double spruce, 2 × 8 inches, was put down 12 feet inside this crib, and 30 feet of Armco interlocking steel piling was driven to form a cofferdam. Excavation then proceeded until silt and water began to boil up from the bottom of the excavation.

At this point, several barrels of sodium silicate grout were injected through small holes cut through the steel piling at about 3-foot intervals. Grout was also injected inside the cofferdam. Excavation went ahead, and small additions of grout were injected whenever boiling occurred. This usually happened at from 4 to 12-hour intervals.

Using this method, it was possible to remove the rotary shield and install the push-type shield without much difficulty. When this was done, the excavation was partly backfilled and the piles pulled. THE END

New color map shows New York Thruway route

A new multicolored map of the New York State Thruway shows major highway connections and points of interest throughout the state. The redesigned folder includes a series of illustrated safe-driving tips; a listing by names and milepost locations of all Thruway interchanges and service and parking areas; and local maps showing connections to the highway.

Thruway connections to comparable expressways and turnpikes in Massachusetts, Connecticut, New Jersey, Pennsylvania, Ohio, and Indiana are included. Tourist attractions are also pictured.

Free copies of the map may be obtained at any of the Thruway interchanges or toll barriers, or by writing to the New York State Thruway Authority, P. O. Box 189, Albany, N. Y.

American Bitumuls awards fellowship to student

Clyde E. Lee, highway research student at the University of California, has been granted a fellowship from American Bitumuls & Asphalt Co., San Francisco, Calif. The fellowship will enable Lee to complete his thesis on "The Determination of Pavement Deflections Under Repeated Load Applications". When completed, the paper will make him eligible for the degree of Doctor of Engineering in Transportation.

United Engineers names

Thomas M. Dahl has been appointed a business representative in the Midwest for United Engineers & Constructors, Inc., Philadelphia, Pa. From Chicago headquarters, Dahl will share responsibilities with and report to J. N. Rolston, Midwestern region vice president for Ohio, Kentucky, Michigan, Indiana, Wisconsin, Illinois, Minnesota, Iowa, and Missouri.

Psaty & Fuhrman elect

Irving L. Lazere has been elected executive vice president of Psaty & Fuhrman, Inc., construction contractors of New York City. Lazere is vice president of Lazere Construction Corp., also of New York City, and will continue to administer to completion the building projects and other affairs of the corporation.

30ch time their batching plant moved

Performance and savings with this plant brought Mr. Jack Hartmann, Vice President (right), and Bud ore, his C.D.E.S. (Caterpillar Dealer Engine Specialist), to the job to plan a second batching plant installation. isfaction resulted in an order for a second identical Cat ctric Set for this contractor's expanding operations.

Mr. Hartmann remarked, "ABOUT ONE MORE MOVE ND OUR FIRST PORTABLE ELECTRIC SET WILL HAVE AID FOR ITSELF IN SAVINGS FROM MOVES ALONE ND IN LESS THAN TWO YEARS. THAT WE LIKE TO SEE."

gine Division, Caterpillar Tractor Co., Peoria, Ill., U.S.A.
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5 The all-new, self-regulated generator for Cat Electric Sets is simple to operate. Voltage is adjustable from 5% above to 10% below nominal rating and regulated within 3½% of rated voltage. It has unsurpassed motor starting ability. Other performance features Mr. Hartmann liked were:

1. Low over-all cost per operating hour.
2. No down time due to power failure or engine failure.
3. No additional help required, due to the unit's simplicity and self-regulating standard equipment.
4. Advertised power produced and maintained.
5. His Caterpillar Dealer Engine Specialist, Parts and Service teams were on around-the-clock availability if anything went wrong. It didn't.

ENGINE POWER BY CATERPILLAR

If something has gone wrong with your present engine or it just won't produce in your excavator, crusher or other construction machinery, talk it over with your C.D.E.S. He can aid you profitably when repowering older machines or specifying engines for new equipment.

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Send me more information about the new Caterpillar Portable Electric Sets. I understand that I am under no obligation.

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←For more facts, use coupon or circle No. 214

An Athey rear-dump, one of three types of rigs hauling rock for the downstream portion of Pomme de Terre Dam near Hermitage, Mo., dumps its load.

Dirt movers fight rains to build ear

The need for flood control on the small Pomme de Terre River in Missouri was brought home to the stage 1 contractor building access roads and placing embankment material for the new dam. Heavy rains often lifted the level of the river 12 feet, flooding much of the valley, washing out sections of haul road, and endangering heavy equipment on the job. Five times the contractor had to retrieve the big 5-foot-diameter culverts that had been washed out from the river crossing.

In order to protect the excavation in the valley from floodwaters, George Bennett Construction Co., Kansas City, Kans., had to build a large perimeter dike. This levee was required by the specifications after it had been clearly indicated to designers that such a protection would be necessary to insure continuance of work.

And in drying out the material in the embankment, the contractor tried everything but rigging up giant fans to blow away the moisture. The material was disked, it was scarified, and it was rehandled by draglines in an effort to dry it out.

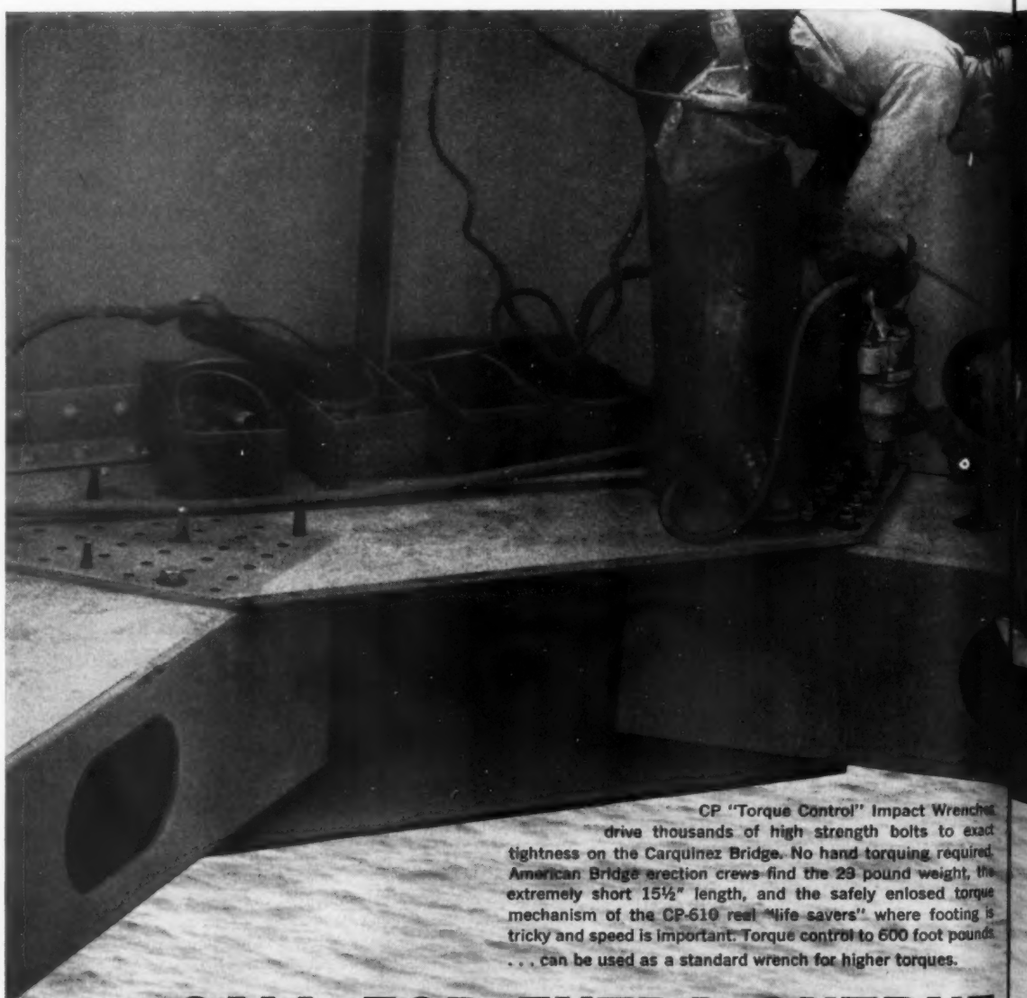
In the early stages of the project, rain and occasional snow made it impossible to drive a pickup from the highway into the job. To make the 1.5-mile trip through the mud, a tractor was pressed into taxi service.

The dam site on the Pomme de Terre River is located about three miles south of Hermitage, Mo. Hermitage is on U. S. 54, approximately 40 miles west of Camdenton and The Lake of The Ozarks. In this region, the Pomme de Terre flows north to join the Osage River, which flows into the Missouri.

During wet seasons, the dam will protect the valley from floods; in dry seasons, it will make possible a normal flow of water in the river. And vacationers will have a place to fish and to try out their boats in any season. Hydroelectric power has also been authorized, but a power plant will not be built until there is more need for it.

The Pomme de Terre River may be small, but it takes a big dam to keep it under control. The rock and earth-fill embankment extends 4,630 feet across the river valley and rises to a height of 155 feet above the stream bed. In addition to the main embankment, a 2,790-foot earth dike is being built along the crest of the hill joining the left abutment. Through the abutment on the opposite side of the dam there will be an uncontrolled chute spillway, as well as a gate-controlled discharge tunnel. The dam was designed by the Kansas City District of the U. S. Army Corps of Engineers.

The reservoir at full pool will have an elevation of 874 feet above mean sea level and will contain some 650,000 acre-feet of water. At conservation pool elevation of 839 feet, the permanent lake will extend about 18



CP "Torque Control" Impact Wrenches drive thousands of high strength bolts to exact tightness on the Carquinez Bridge. No hand torquing required. American Bridge erection crews find the 29 pound weight, the extremely short 15½" length, and the safely enlosed torque mechanism of the CP-610 real "life savers" where footing is tricky and speed is important. Torque control to 600 foot pounds . . . can be used as a standard wrench for higher torques.

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Anytime there's a high demand for air you'll find CP "Power Vane" Rotary Compressors ready for action. "Power Vane" Rotaries have the ability to provide maximum output with minimum attention—do work-horse jobs with little margin for failure. Capacities: 125; 210; 365; 600 and 900 cu. ft.

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earth-rock dam

Working in several feet of water on the downstream side of the dam, where overburden is excavated to limestone rock, a Michigan 175A cleans loose gravel from the natural limestone surface. The pump keeps water from rising in the excavation. In the background, a C & D Movall works the rock fill near the temporary earth dike.

miles upstream on the Pomme de Terre and about 15 miles on Lindley Creek.

Construction starts

Bennett Construction Co. moved equipment in to the dam site to start work on the stage 1 contract in January of last year. The $892,000 contract called for the building of about two miles of access roads, as well as the placing of some 400,000 cubic yards of rock and 400,000 cubic yards of dirt on the embankment. The work, which was finished in the spring of this year, completed the foundations of the dam and brought it from 10 to 20 feet out of the ground. The entire dam is scheduled for completion in 1961.

Dirt work

Before the dam could go up, it first had to go down. The downstream half of the site, which supported the rock fill, had to be excavated 15 to 25 feet to a layer of limestone. The excavated material was used to build up the impervious core, as well as the random fill on the upstream half of the dam. No excavation was necessary for the upstream half of the dam, which rests on natural ground.

Because of the excessive rains, the contractor had to fight for every yard of dirt that was moved. Two 3-yard draglines, one a P&H 255A, built dikes about 20 feet high around the perimeter of the excavation to protect it from the flooding river. The draglines loaded into five Euclid bottom-dumps, which moved dirt to the upstream embankment. A fleet of four scrapers, push-loaded by two big D9's, also aided in the dirt moving.

The drying of the material, both in the cuts and the embankments, was speeded by a variety of equipment. A heavy-duty Rome disk harrow and a 16-tooth scarifier were pulled by tractors to break up the moist earth. On the embankment, the P&H 255A dragline sometimes opened up the wet fill, which was then allowed to dry.

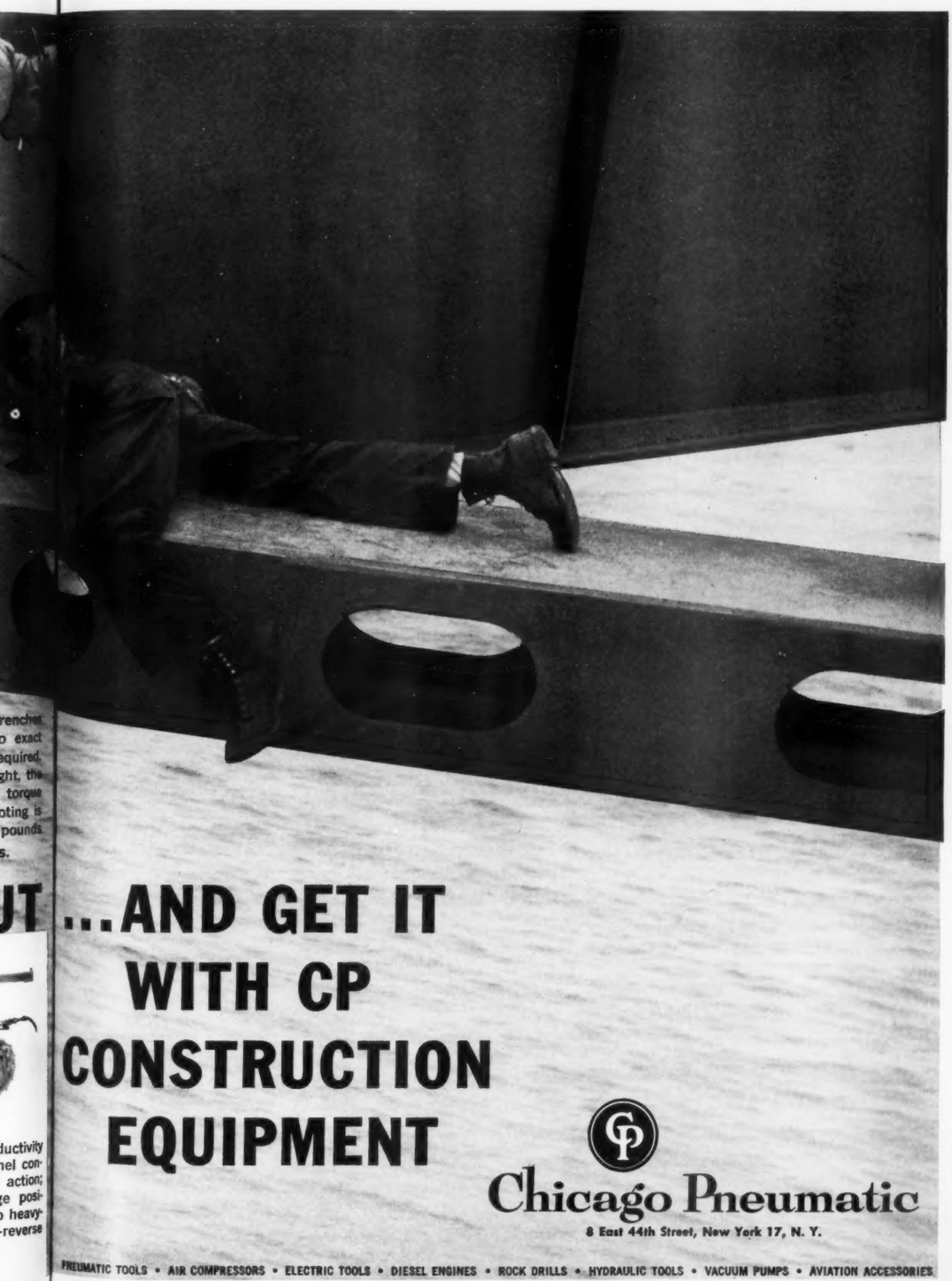
Before the impervious material could be placed along the axis of the dam, a grout curtain had to be put down. Holes for the grout were drilled on 3-foot centers to alternate depths of 20 and 40 feet. The grout curtain extended along the center line of the cutoff trench for the width of the valley and up the side of the left abutment.

Rock fill

The rock fill for the downstream portion of the dam was obtained from both the inlet and outlet channel excavation for the diversion tunnel. The rock cuts, which were only partially completed under Bennett's contract, yielded about 400,000 cubic yards of rock. The deep side-hill cuts were stepped down on benches to approximate the slope of the side of the channel.

In drilling the limestone rock of

(Continued on page 26)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"MODEL 12 . . . **FINEST** TRACK-TYPE SHOVEL EVER DESIGNED"

SAYS R. L. SHEPHERD
SHEPHERD CONSTRUCTION CO.
MUSCATINE, IOWA

"On the basis of its performance for us, we are looking forward to buying another Model 12 'PAYLOADER' soon . . . and because of its great versatility, it has our recommendation as a money-making tool for both small and large operators," says the owner of Shepherd Construction Co., Muscatine, Iowa.

"We first learned about the Model 12 two years ago when we were in the market for a front end shovel in the 2-yd. class. Because of its radical new design (rear mounted engine), we thought it merited serious consideration. After discussing it with the Hough Distributor, Herman M. Brown Company, it didn't take long to decide — we took delivery on our machine in January, 1957. We've used it on every conceivable type of job since then and found its performance excellent in every way. It has 2500 hours of hard use on it now."

Operator Comfort is Important

"Of all the wonderful improvements on the Model 12 over older design track machines, we feel its center seating position takes the spotlight. It makes the machine ride as easy as an automobile, provides excellent vision and places the operating levers so that it's a natural movement to lay your hands on any control without having to twist, strain or kick."

Has Power to Spare

Mr. Shepherd has found that "an experienced operator can master the Model 12 after a few hours of practice. It has the finest bucket action we have ever used. This along with its fine operating diesel engine, large torque converter and power-shift transmission (master clutch eliminated) gives us a production record of which we are very proud."

High Production

"Even though this 'PAYLOADER' is rated at 1¾-yd. capacity, we have loaded out 8 to 9-yd. trucks with three passes in 2-minutes' time, excavating from a solid bank, not loose fill. The normal bucket load is always 2-yards plus. We average 45-yds. per hour on basement excavation and easily maintain perfectly straight side walls and 1″ plus or minus on floors."

Exceptional Balance and Stability

"Our first impression of the Model 12 was that it would be top heavy but we have used it on very steep grades and found it to be as stable as any track machine. Its flotation is exceptionally good because the loaded bucket is balanced by the rear-mounted engine. This causes the machine to run flat on its full tracks at all times. We have even used it as an effective dozer — it can remove trees along with tractors several tons larger and pushes 3 to 5-yards of material at a time. But its fast cycle time is what really counts," according to Mr. Shepherd.

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You can't compete if your equipment is obsolete — so, prove to yourself that the Model 12 will outperform anything near its size by asking your Hough Distributor for a demonstration or, write for your copy of an informative 8-page bulletin.
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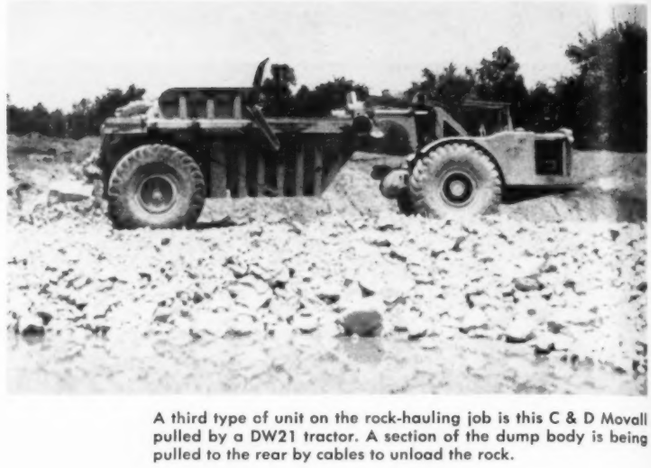
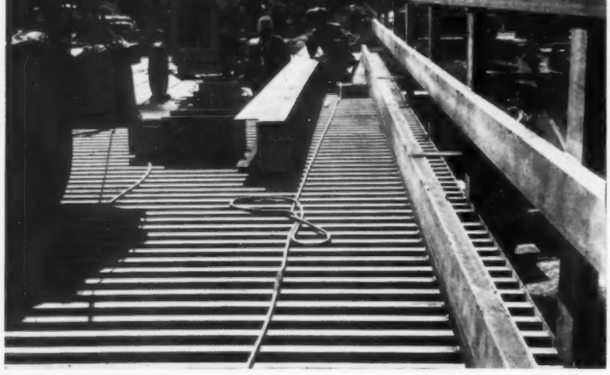
PAYLOADER
PAYLOADER®

A Euclid bottom-dump—not usually used for dumping rock—drops its load in a hurry as it rolls in over the rock fill. Broken rock is obtained from the outlet-channel excavation.



A third type of unit on the rock-hauling job is this C & D Movall pulled by a DW21 tractor. A section of the dump body is being pulled to the rear by cables to unload the rock.

STEEL BRIDGE FLOOR Gives New Life to Old Bridges



The Bethlehem bridge floor over this bridge in Pennsylvania will require very little maintenance.

Steel bridge floor over the solid wood stringers of this rural Tennessee span resulted in a strong bridge.

Applying the first surface course on a rural Connecticut bridge. A second wearing course is also applied.

When the old flooring of these bridges needed replacing, the floors were stripped to the stringers, repairs made and new decks of Bethlehem Formed Steel Bridge Floor laid down. Result: strong, smooth, rattle-proof floors, requiring little maintenance.

In each case, Bethlehem Formed Steel Bridge Floor was easy to install. First, the worn planking was removed, then the Bridge Floor was carried from the stockpile, where it nested compactly in small piles, to the bridge. After proper positioning, the 2-ft-wide corrugated steel plates were welded to the stringers, and adjacent plates welded together. In the case of wooden stringers, the steel floor is easily attached with lag screws and washers.

After a surfacing material was applied, the new floors met all strength specifications of the American Association of State Highway Officials' standard specifications for highway bridges.

For complete information on Formed Steel Bridge Flooring, phone the nearest Bethlehem sales office.

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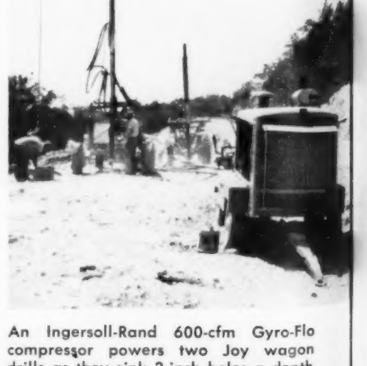
(*Continued from page 23*)

the outlet channel, the contractor generally used two Joy wagon drills, mounted on Ford tractors and powered by an Ingersoll-Rand 600-cfm compressor. These put down 12-foot-deep holes on a 6×10 pattern. The rock was broken up by Atlas 40 to 60 per cent dynamite used with Hercules Nitro Carbo Nitrate. Blasting was unpredictable because of the many seams in the limestone. In the upper areas of the cut, the limestone was of poor quality and badly oxidized.

A 2½-yard shovel loaded the rock into haul units that roared down the steep road into the valley. Three types of haulers wheeled out onto the rock fill and dumped their loads: the bottom-dump Euclid let the 12 yards of rock drop out of its belly; the Athey-Cat rear-dump arched its back and let the rock chute out the rear; the C & D Movall stayed flat while cables pulled a section of the box forward to push the rock out the back.

The rock was built up in 5-foot lifts by a Cat D8 tractor with a Fleco rake. The tops of the lifts were roughed up with a scarifier to prevent a shearing action between lifts. Extreme care was taken to prepare the surface of the base rock to receive the first lift: the surface was sluiced clean with a Gorman-Rupp 3-inch pump, and any loose rock not



An Ingersoll-Rand 600-cfm Gyro-Flo compressor powers two Joy wagon drills as they sink 3-inch holes a depth of 12 feet into the limestone rock of the outlet channel. The workman at left is tamping sticks of Atlas 40 to 60 per cent dynamite into the holes.

removed by this method was taken out by hand.

Crusher moved into cut

During the approach-channel excavation, a 21×40 jaw crusher was moved in to process rock used in the base course of some of the access roads. The Roger Iron Works crusher, fed by a Lorain 1-yard shovel, broke the rock down to minus 5-inch material. This was conveyed to a Gruendler hammermill, which further reduced the material to 1½-inch size. This, in turn, was dropped into a surge bin feeding a belt conveyor that loaded the trucks. The entire crushing outfit moved forward as the shovel worked into the cut.

The crusher also supplied rock to go into the 3-stage filter of the dam. The filter, which separated the impervious core from the rock fill, was built of three layers of material ranging from sand to 6-inch rock. It prevents the fines of the impervious material from entering the rock fill.

Personnel

The project is under the supervision of the Kansas City District of the U. S. Army Corps of Engineers, which is headed by Col. Lawrence E. Laurion, district engineer. Close supervision of the project at the dam site is maintained by F. M. Fahy, resident engineer, and Fred Banks, office engineer.

Glenn Kistler was the project superintendent for George Bennett Construction Co. He was assisted by Gene Bowers, dirt foreman, and Benny Miles, rock foreman. THE END

Baseboard heating warms temporary living quarters for Noxon Dam workers

Baseboard electric heating, supplied by the Westinghouse Electric Corp., is being used to warm the temporary living quarters of construction workers at the Noxon Dam near Thompson Falls, Mont. Supervisory personnel of the Morrison-Knudsen Co., contractor building the dam for the Washington Water Power Co., are occupying temporary houses on the job site. There are three barracks buildings for construction personnel: two 80-man and one 30-man bunkhouse.

The barracks, office, and infirmary buildings are of log construction, set on 4-inch concrete slabs and with no insulation or storm windows. Although temperatures may drop to 30 degrees below zero, a comfortable indoor climate is provided by thermostatically controlled baseboard electric heating, which radiates and circulates heat simultaneously.

New Cat plant at Aurora

The Caterpillar Tractor Co., Peoria, Ill., has started production on D4 tractors at its new plant, located on a 352-acre site three miles south of Aurora, Ill. Production at the new plant, with 1,280,000 square feet of manufacturing space, is expected to be in full swing next year.

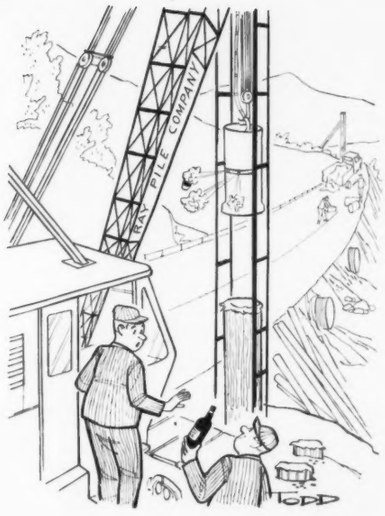
U. S. professors inspect Russian engineer schools

Eight American engineering professors recently completed the first post-war inspection of about 20 of Russia's engineering schools and educational organizations.

At each school, the men visited administrators and teachers, to observe classes and laboratory facilities, study research activities, and collect syllabuses, textbooks, and other material unavailable in the United States.

The eight-man mission included Dr. Frederick C. Lindvall, Professor Newman A. Hall, William T. Alexander, Dr. William L. Everitt, Professor Ralph E. Fadum, Dr. Albert G. Guy, Dr. Ralph A. Morgen, and Dr. Leon Trilling.

"No, thanks, I have to drive".



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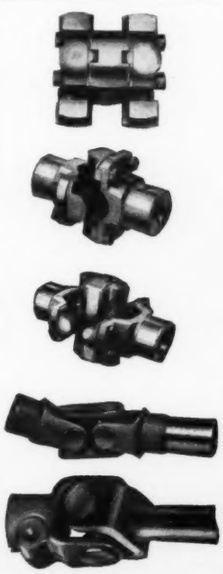

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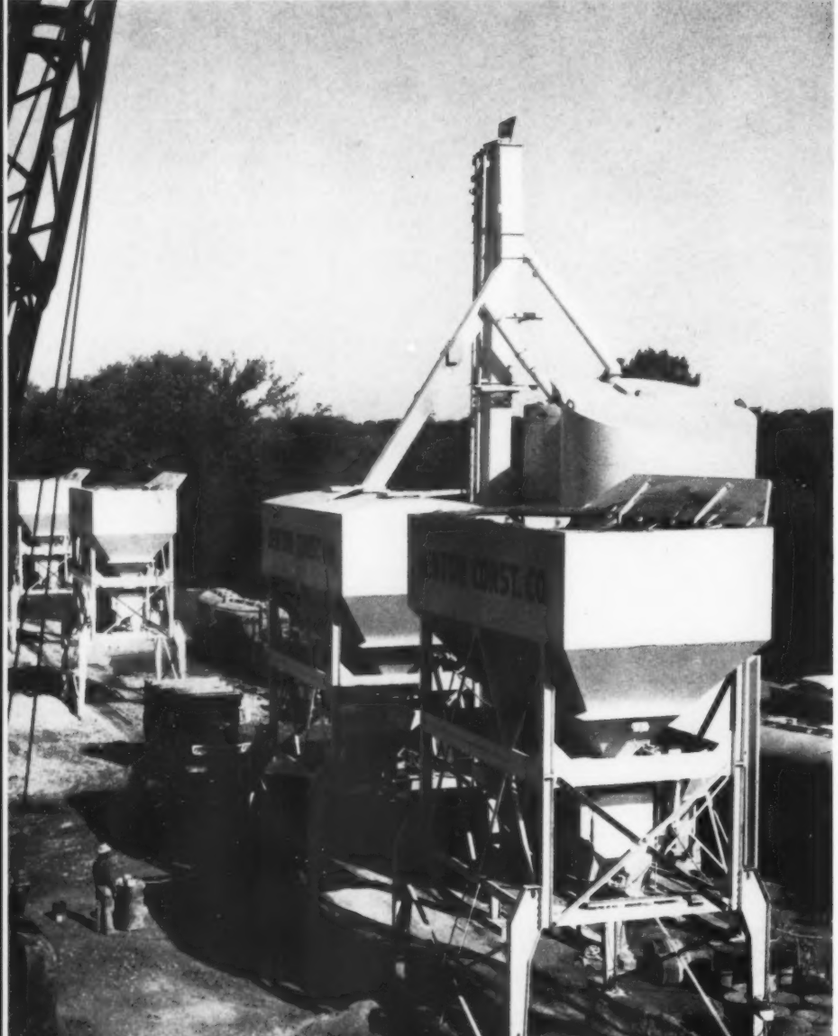


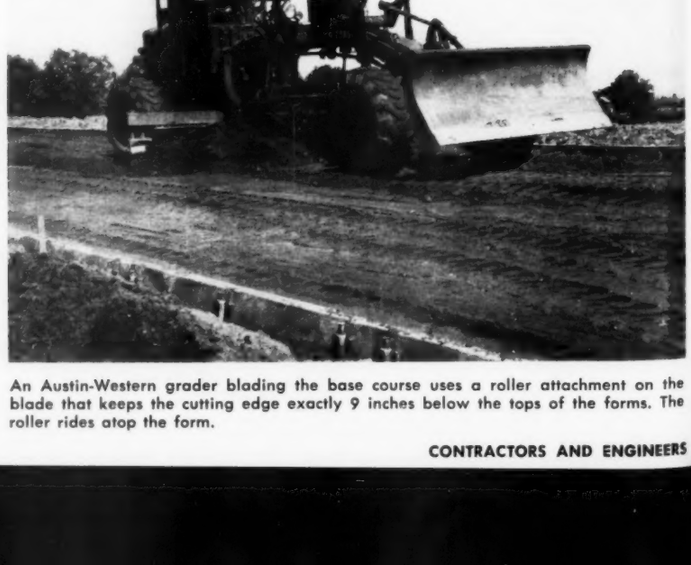
Equipment for the batching and paving ends of a concrete road job on the M60 bypass near Jackson, Mich., cut costs by eliminating the need for several crewmen. At the Butler batching setup, where trucks pick up, in order, medium-size aggregate, coarse aggregate, cement, and sand, all batchers except the one for cement have push-button controls operated by the truck drivers. Cement is discharged by the man in front of the barrel, center.

Modern equipment saves manpower on concrete paving project

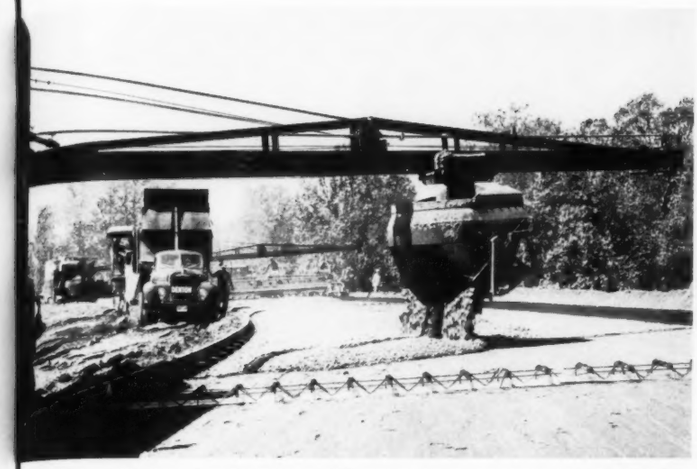
Batching and paving equipment needs fewer men for operation; production stays high on job while payroll costs are lowered

by BILL ALLEN
field editor

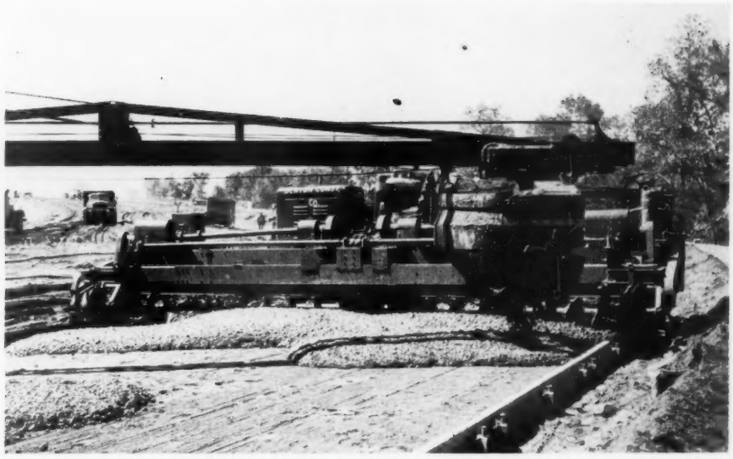
A Koehring 605 crane with Owen rehandling bucket feeds the medium-size aggregate to the 75-ton bin of the Butler batch plant. The driver of the Mack truck presses the button that discharges four batches simultaneously.



An Austin-Western grader blading the base course uses a roller attachment on the blade that keeps the cutting edge exactly 9 inches below the tops of the forms. The roller rides atop the form.



The first of three Rex dual-drum 34-E pavers dumps concrete to the subgrade, while the second paver is being fed by a Mack truck. Dowel assemblies, such as the one in the foreground, are spaced at 99 feet.



A second Rex paver dumps ahead of a Jaeger auger-type spreader, which strikes off the mix at 6 inches. Wire mesh is then set by hand, and a third paver places the last 3 inches of concrete to be struck off by a spreader-finisher.

Good equipment cut down on manpower on a highway paving job near Jackson, Mich.

The efficiency of the operation was promoted by a fully automatic batch plant from which truck drivers discharged their own loads. With the push of a button, a driver released four batches of aggregate simultaneously into his truck. Because of the automatic controls, only one man was needed to operate the plant. (This number does not include the two crane operators.)

Another new piece of equipment increased production, yet reduced labor costs. According to the contractor, a combination float and finishing machine cut one helper and two hand finishers off his payroll. The rig required only one man to operate it.

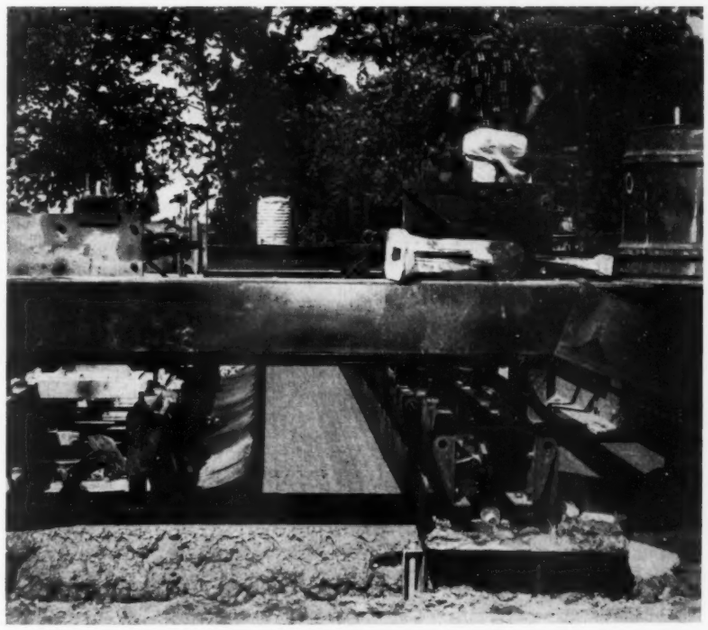
The owner of the modern paving equipment is Denton Construction Co., Grosse Pointe Woods, Mich. The company held the $1.7 million contract for the grading and paving of 3¼ miles of 4-lane divided highway on the M60 bypass west of Jackson, Mich. During a 5-week period, Denton completed the paving of the two 24-foot reinforced-concrete roadways.

Production

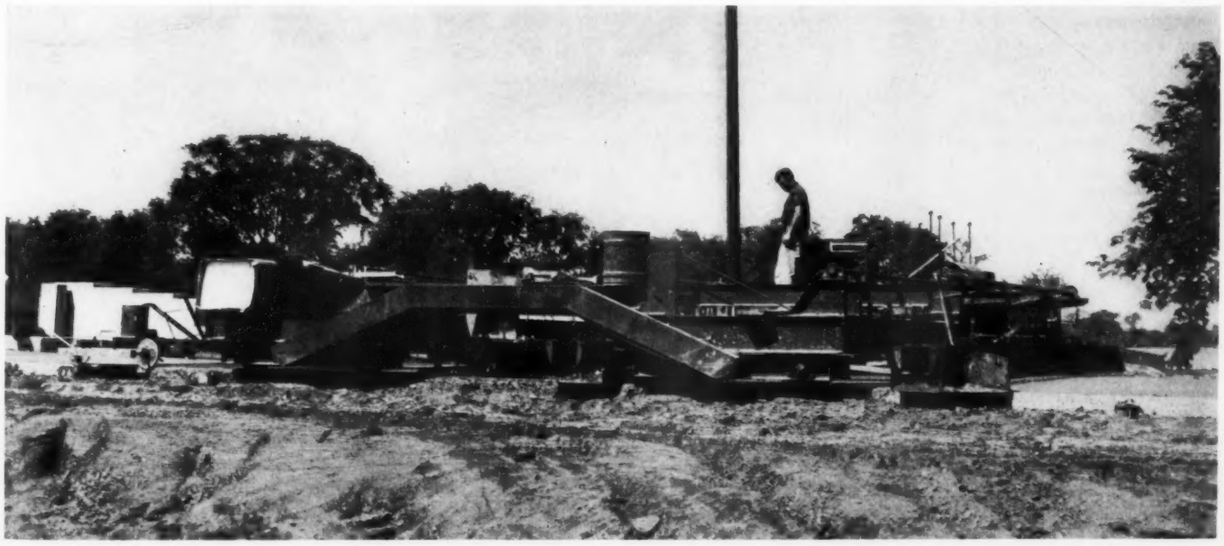
Because of adverse conditions, production on the job was not outstanding. The dirt subcontractor, hampered by bad weather, was unable to keep ahead of the paving operation in laying the subgrade. The sandy, unstable soil on either side of the roadway made it difficult for batch trucks and water trucks to operate alongside the forms. In spite of these difficulties, the paving train laid down as much as 3,000 feet of 24-foot-wide pavement in one day.

On a subsequent job under more favorable conditions, the same equip-

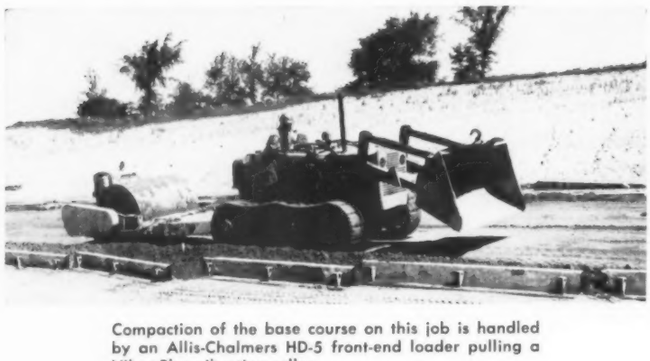
(*Continued on next page*)



On one lane, the contractor used a Heltzel Flex-Plane 3-screed float finisher to complete the slab. About 3 feet behind the suspended transverse screed, right, a shoelike third screed smooths the surface without moving back and forth.



The one-man-operated, 3-screed Flex-Plane float finisher eliminated the need of a transverse finisher, but no measurable difference in slab smoothness was noted when the rig was used alone. The screed at the front and the one under the operator are transverse.



Compaction of the base course on this job is handled by an Allis-Chalmers HD-5 front-end loader pulling a Vibro-Plus vibrating roller.

Crew members drive form stakes with an Ingersoll-Rand air hammer powered by a Le Roi Tractair compressor. Earth is then compacted with an air tamper.

(*Continued from preceding page*)

ment set a paving record for the state. On a project near Dundee, Mich., Denton rolled out 6,029 feet of 24-foot-wide 9-inch-thick reinforced-concrete pavement in 12½ hours. This is believed to be the world's record.

Batch plant

During peak production, the automatic batch plant played an important role. It has turned out as many as 300 cubic yards per hour. The plant has four separate batchers—two for aggregate, one for sand, and one for cement. Each has four weigh buckets, and these were discharged simultaneously by the truck driver. Without leaving his truck, he pushed a button which opened the gates of the buckets. Pushing another button, he closed the gates and automatically started the plant reloading the buckets for the next truck. Trucks made four stops going through the plant.

Equipment on the job

- Butler automatic batch plant
- Koehring 605 crane
- Link-Belt 2-yard crane
- Owen and Erie buckets
- Mack and Ford batch trucks
- Allis-Chalmers HD-5 front-end loader
- Vibro-Plus vibrating roller
- Le Roi Tractair compressor
- Ingersoll-Rand air hammer
- Ingersoll-Rand air tamper
- Austin-Western grader
- Galion 10-ton roller
- Gar Wood Buckeye subgrader
- Three Rex 34-E dual-drum pavers
- Jaeger auger-type spreader
- Jaeger spreader and finisher
- Heltzel Flex-Plane float finisher

The setup at the cement batcher was a little different. Rather than have the truck driver discharge the load, Denton preferred to have a plant man push the button. This man made sure that a truck was in the correct position to receive the load. He also gave load tickets to the drivers. The plant is equipped with two 625-barrel storage silos and one 400-barrel overhead silo.

To protect the concrete from the

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	MODEL	TYPE OF MOUNTING	CRANE LIFT CAPACITIES (Rubber-tired machines rated at 85% of tipping load.)	
ON RUBBER	205	3-axle truck, or 21.5 mph Cruiser	30,000 lbs.	at 12-ft. radius
	305	3-axle truck, or 18 mph Cruiser	50,000 lbs.	at 12-ft. radius
	435	4-axle truck	70,000 lbs.	at 15-ft. radius
	545	4-axle truck	90,000 lbs.	at 15-ft. radius
		Size shovel	CRANE LIFT CAPACITIES (Crawler ratings based on 75% of tipping load.)	
ON CRAWLERS	205	½ Cu. Yd.	20,000 lbs.	at 10-ft. radius
	305	¾ Cu. Yd.	30,000 lbs.	at 12-ft. radius
	405	1 Cu. Yd.	40,000 lbs.	at 12-ft. radius
	545	(Crane only—85% rating)	90,000 lbs.	at 12-ft. radius
	605	1½ Cu. Yds.	72,300 lbs.	at 12-ft. radius
	805	2 Cu. Yds.	104,200 lbs.	at 12-ft. radius
	1205	3 Cu. Yds.	190,000 lbs.	at 12-ft. radius

Extra lift capacity means . . . **MORE WORK CAPACITY WITH ALL ATTACHMENTS**

Preparing the way for the paving train, a Galion 3-wheel 10-ton roller compacts earth in the lane ahead of the Buckeye subgrader.

freezing and thawing action of Michigan winters, an air-entraining agent was added to the batch. At the sand batcher, a solution of Darex was metered out to give the concrete from 5 to 6 per cent air content.

Aggregates and sand were fed to the plant by two cranes, each with a 2¼-yard bucket.

Paving train

The paving train was headed by two dual-drum pavers. After an auger-type spreader leveled the concrete to a 6-inch depth, sections of wire mesh were set by hand. The spreader was equipped with a vibrator on each side to consolidate the mix near the forms.

A third paver added the top 3 inches of concrete, which was leveled by a combination spreader and finisher. Riding the rails behind this machine came a transverse finisher, then the float-finisher, a belt finisher and burlap drag, and a spray rig that applied curing compound to the fresh concrete.

The superintendent was pleased with the performance of the company's new floating and finishing rig, which cut down on manpower. It required but one operator; and only three hand finishers worked behind it.

On this job, the contractor was trying to convince the highway department that the transverse finisher in the train was not necessary. On one lane, the finisher was used; on the other lane, it wasn't. The results of this test indicated no measurable difference in smoothness.

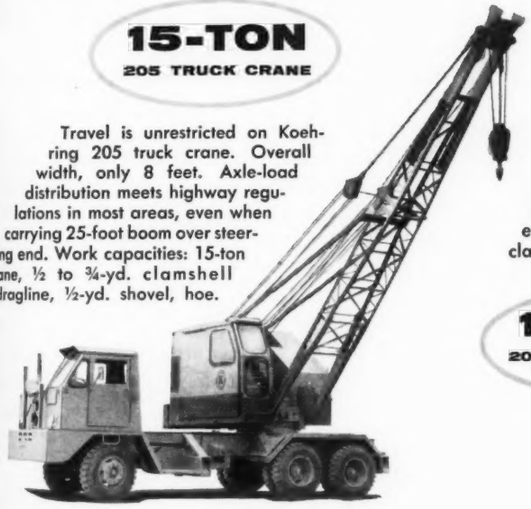
Personnel

For the Denton Construction Co., Micky Palmer was superintendent. Edward Rohacz was the project engineer for the highway department. John Mackie is State Highway Commissioner of Michigan. THE END

Koehring fleet.....ON RUBBER

15-TON
205 TRUCK CRANE

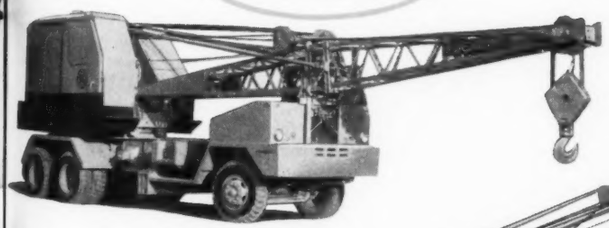
Travel is unrestricted on Koehring 205 truck crane. Overall width, only 8 feet. Axle-load distribution meets highway regulations in most areas, even when carrying 25-foot boom over steering end. Work capacities: 15-ton crane, ½ to ¾-yd. clamshell or dragline, ½-yd. shovel, hoe.



One man controls all operations . . . one engine supplies all power for work-and-travel on Koehring 205 Cruiser (below). It drives job-to-job at *21.5 mph* (highway travel unrestricted). There's torque-converter on 4-wheel drive, automotive power-steering, 27½-foot turn radius, 30% gradability. Koehring 205 Cruiser has all standard attachments: clamshell, dragline, shovel, hoe.

15-TON
205 CRUISER CRANE

25-TON
305 TRUCK CRANE



Here's another heavy-duty, high-reach crane worth looking into . . . a truck-mounted 305, that raises up to 100 feet of main boom (or 130-foot boom-and-jib) *with low A-frame!* It's a 25-ton capacity crane with clamshell, dragline, shovel, hoe versatility.

45-TON
545 TRUCK CRANE

With this big, truck-mounted *545*, Koehring now brings you *45 tons* of lift capacity . . . *plus* quick conversion from fully-equipped machine to roadable machine.

K829

Pick the size that suits YOU . . . then call Koehring distributor today for a demonstration.

KOEHRING DIVISION OF KOEHRING COMPANY
Milwaukee 16, Wisconsin

Koehring excavators and cranes also manufactured in: CANADA • ENGLAND • SPAIN • JAPAN

For more facts, use Request Card at page 18 and circle No. 219

New York Port Authority starts pier construction for new marine terminal

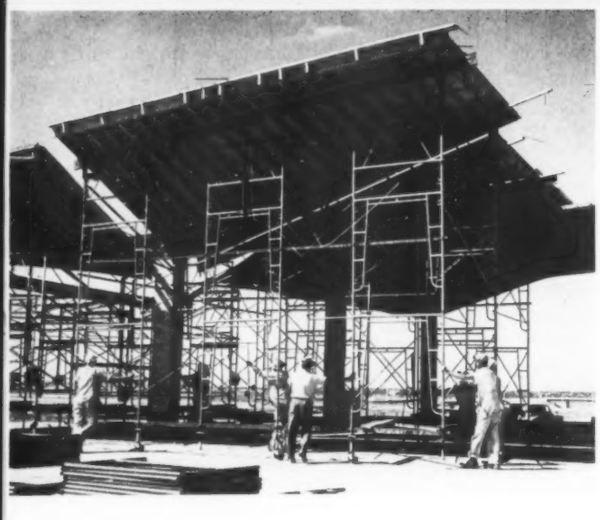
Pile driving is well under way at the head of the new Elizabeth (N. J.) Channel for the $150 million Elizabeth-Port Authority Piers. Dredging of the new channel, which will be 9,000 feet long, 600 to 800 feet wide, and 35 feet deep, extending inshore from the Federal Channel in Newark Bay, was started in July and will be completed in October, 1959.

The Elizabeth-Port Authority Piers will be developed on 703 acres of land, south of Bound Creek along Newark Bay. The plan includes 24 vessel berths supported by 400 acres of transit and open-storage area. About 300 additional acres will accommodate areas furnishing about 5 million square feet of distribution and cargo-handling space. It is estimated that the new marine terminal will handle nearly 5 million tons of cargo annually, of which at least half will be handled at container ship berths.

At Port Newark, the Port of New York Authority is investing $125 million in building and expansion. Eleven new vessel berths will be provided to expand the seaport's capacity to 39 berths, and 115 additional acres will be developed along the north side of the new Elizabeth Channel. The construction of three new transit sheds on the north side of Newark Channel and about 3 million square feet of distribution buildings throughout the port will complete the Port Newark development.

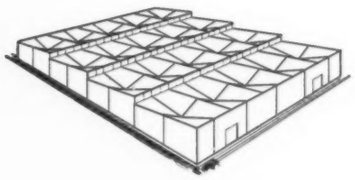
Monatco firm moves

The Monatco Mfg. Corp., Kansas City, Mo., has moved to a new factory and general office building at Front St. and Waverly Ave., Kansas City, Kans. The firm manufactures hydraulic equipment and an asphalt heater-planer.



Four hyperbolic paraboloid form units, around a central column, make up a form for one of the inverted "umbrellas" for the roof of a plant in the Great Southwest Industrial District between Fort Worth and Dallas. Forms are rolled into position on towers of Safway scaffolding.

Special forms speed work on hyperbolic paraboloid roof



To the workers of the Commercial Tooling Co. plant, in the Great Southwest Industrial Development, near Dallas, Texas, a hyperbolic paraboloid is a lot more than an unpronounceable geometric term; it is a roof over their heads — a graceful roof of thin-shell concrete.

To construction men, the hyperbolic paraboloid meant a challenge. The double-curved surface was a tough one to form economically. After trying and discarding one method, they came up with another that was faster and more efficient.

To the leaders of Great Southwest Corp., Dallas, the hyperbolic paraboloid represented a new experiment in commercial building. The new type of construction has added to the beauty of their buildings, yet has decreased total construction costs.

Prestressed wall panels

The roof was not the only unusual

The first use of H-P construction in the Great Southwest Industrial Development was made on the Cross Roads Restaurant roof, which was poured in much the same manner as the plant roof. Here, the 2,500-pound lightweight concrete is placed 3 inches thick. The light network of reinforcing contributed little to the strength of the slab. It is used primarily to keep concrete from cracking during large temperature changes.

A SURE-FIRE SUCCESS FORMULA!

The Cunningham Construction Company is proud of its reputation for high-production earth moving. Says Don Cunningham: "The combination of Allis-Chalmers' productive machines and a first-rate operating crew, teamed with the excellent service our dealer provides, amounts to *an unbeatable formula for sure profits in this industry.*"

The equipment spread includes four Allis-Chalmers motor scrapers—two TS-360's and two TS-260's—plus five turbocharged HD-21 crawler tractors. Two of the tractors are used as pushers, one as a dozer. Another HD-21 tows a four-gang sheepsfoot roller and the fifth pulls an 18-yd scraper. An Allis-Chalmers FORTY FIVE motor grader levels fill, keeps haul routes smooth for high-speed scraper cycles.

Big 120-horsepower FORTY FIVE motor grader blades fill at dam site, keeps pace with fast-moving equipment like the 20-yard TS-360 motor scraper at right.

The flood control job consists of building two dams and diversion dikes, moving an estimated 325,000 cu yd in the Dona Ana area north of Las Cruces, New Mexico. Working a 54-hour week, the 10-man crew moved nearly 200,000 yd in the first 4½ weeks. This impressive volume brought construction people from all over Texas and New Mexico to see the spread in action.

Don Cunningham, veteran of more than 30 years in earth moving, points out that such performance is a powerful factor in bringing in more construction jobs.

They cut a 6-flood control job to

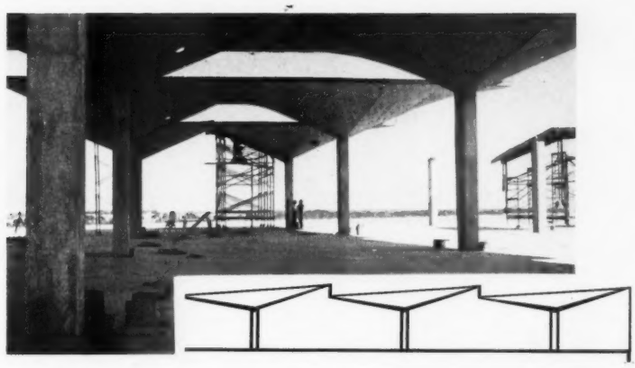
with Allis-Chalmers construction machinery!

Don Cunningham Construction Co.—with a crack crew and a fleet of Allis-Chalmers construction machines—have set an outstanding record on a New Mexico soil conservation job. They completed a flood control project scheduled for 180 days in 75. It involved 325,000 yd of earth fill.

Don Cunningham gives major credit to his Allis-Chalmers fleet—motor scrapers, crawler tractors and motor grader. He's convinced that top machine availability and extreme ease of handling are the big reasons why men and equipment were able to maintain the record pace. Cunningham estimates profit on this contract will be 20 percent greater than figured in the original bid—a hefty bonus on any job!

Look ahead... *move ahead*...and stay ahead

Pretensioned-concrete panels with an exposed aggregate finish on one side are unloaded from a trailer as work progresses on the curtain wall of the building. The panels, which are 4 feet×17 feet×5 inches, contain four strands. Each of these is stressed to 14,000 pounds.



Pairs of the inverted "umbrellas" shadow the floor of the new plant. Spaces between the units are for skylights.

t a 6-month ob to 2½

Don Cunningham
El Paso, Texas

Four Allis-Chalmers motor scrapers, push-loaded by 225-horsepower turbocharged, torque converter-equipped HD-21's, moved nearly a quarter of a million yards the first month, helped boost profits 20 percent for the whole job.

PREVENTIVE MAINTENANCE PAYS OFF AGAIN!

Chief mechanic, "Snuffy" Oliver, and his assistant have an effective preventive maintenance program, including daily inspection of tracks, fan belts, blowers, turbochargers, cables, clutches.

This regular maintenance keeps Cunningham's Allis-Chalmers fleet in first-class condition. Daily lubrication, servicing and inspection requires about 20 minutes a day for each machine. No other time was lost during the nine-hour working shift.

Compacting scraper-hauled fill, big HD-21 crawler tractor tows four-gang sheepsfoot roller.

The easy-service design of Allis-Chalmers crawler tractors, motor scrapers and motor graders speeds the preventive maintenance routine. For example, truck wheels, idlers and support rollers need lubrication only once every 1,000 operating hours. Time-saving convenience like this keeps every machine ready for action.

Whether your operations call for one unit or a fleet, you can get high production like this. Your Allis-Chalmers dealer will recommend the right equipment for your jobs—from a complete line of up-to-the-minute construction machinery. See him now and ask for a demonstration on your job. Allis-Chalmers, Construction Machinery Division, Milwaukee, Wisconsin.

ALLIS-CHALMERS

For more facts, use Request Card at page 18 and circle No. 220

feature of the building. The exterior curtain wall was made up of horizontal panels of prestressed concrete fitted between vertical H-beams. Supplied and erected by Span, Inc. of Dallas, each 4×17-foot panel contained four tension strands.

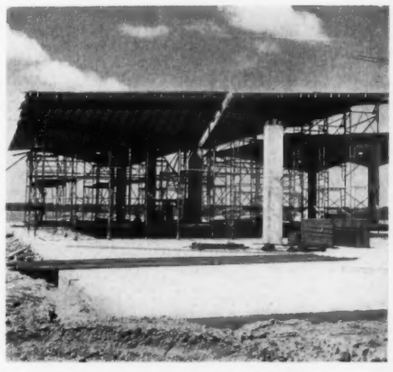
The 5-inch-thick panels, with exposed aggregate finish on the outside and a painted surface on the inside, formed the completed wall. Asphalt-impregnated felt sealed the lap joint between the panels. The 6-inch H-beam which held the panels rested with its base on the grade beam and its top welded to brackets in the roof.

Big development

Great Southwest Corp., which is developing the 5,000-acre industrial district, not only provides an ideal site for a manufacturing plant, but is building community centers, a million-square-foot warehouse, and a consolidated motor freight terminal. The 293-acre Sports Center features a 32-lane bowling alley of all-concrete construction. (See "Girders 96 Feet Long Are Post-Tensioned for Bowling Alley Roof", C&E, September, 1958, page 70.)

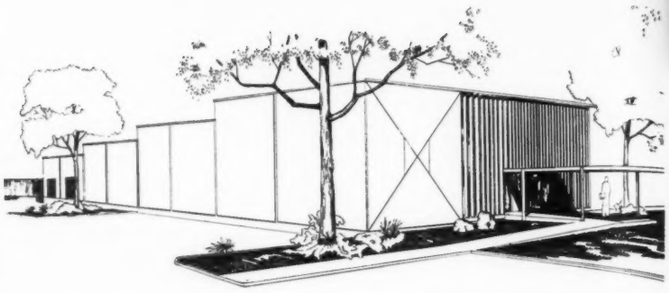
Hyperbolic paraboloids

Great Southwest Corp.'s first use of H-P construction was the roof of the Cross Roads Restaurant, also located



Two complete sets of forms are used on the job, each consisting of four sections. Each section supports a 52×31-foot shell. It takes half a day to strip and reset forms, then set steel for one "umbrella". Another half day is needed to pour concrete. The small crew builds 1,600 square feet of roof per day.

For more facts on Insert, circle No. 222→



A Bay City mobile crane prepares to lift one of the wall panels into position between two 6-inch H-beams. Note the spaces left in the roof for the skylights.

(*Continued from preceding page*)

in the district. Although the final results were satisfactory, project manager Luther Clark believed that the method of forming the shells could be improved. Each "umbrella" of the restaurant roof was supported by four aluminum trusses resting on adjustable steel shores. The trusses were topped with wooden form sections. Forming was slow because many individual pieces in the falsework and form had to be assembled and disassembled. Also, trusses had to be handled with a crane.

For the Commercial Tooling building, Clark, with the help of Walter Grindstaff, Walco Mfg. & Supply Co., Inc., Dallas, designed and built a much more practical set of forms. Now, two hyperbolic paraboloid buildings have been completed — one conventional, the other with a clerestory tilt — and the results of construction research and development are deemed very satisfactory. The structural design and forming method developed, it is felt, can be exploited most effectively in buildings of over 100,000 square feet. This will make possible a highly efficient scheduling and use of forms.

Clark designed the four form sections, supported by rolling steel scaffolding, to support each of the 52×31-foot shells. Each section, a complete hyperbolic paraboloid, formed one-quarter of the total shell.

Safway scaffolding, joined with angles and braces, supported the two 10-inch channels of each section. The two steel channels carried 2×8's on 16-inch centers, which in turn carried the ½-inch plywood sheathing. Two of the form sections were equipped with hand winches to lower the forms in stripping. The scaffolding sections were joined together around the central column by a system of steel hasps and clamps. This held the scaffolding in place and kept the wooden forms pressed tightly together.

Two complete sets of forms were necessary to build the 20 "umbrellas" that cover the 207×154-foot building. The "umbrellas" are arranged in four rows of five each. Natural overhead lighting was provided by tilting the shells at a slight angle in one direction. The 3-foot vertical gaps in the roof received glass skylights.

Each column contains a 4-inch galvanized pipe to drain water from

UNIT
fast Handling
with SAFETY!
• UNIT is designed for speed and efficiency in handling all types of construction materials. Here, for example, UNIT is lifting heavy sewer pipe and spotting it perfectly into the desired position. Adjustable hook rollers, extra long crawlers and wide multiple hinged crawler shoes provide all-around stability. Full circle swing, controlled from within the FULL VISION CAB assures safe and efficient handling. The operator has a complete view of the entire job at all times. Get all the facts about this modern machine. Write today for literature.
UNIT CRANE
and SHOVEL CORP.
6300 W. Burnham St., Milwaukee 19, Wisconsin. U.S.A.

For more facts, use Request Card at page 18 and circle No. 221

HOW LORAIN'S EXCLUSIVE FEATURES COMBINE TO BUILD YOUR PROFITS

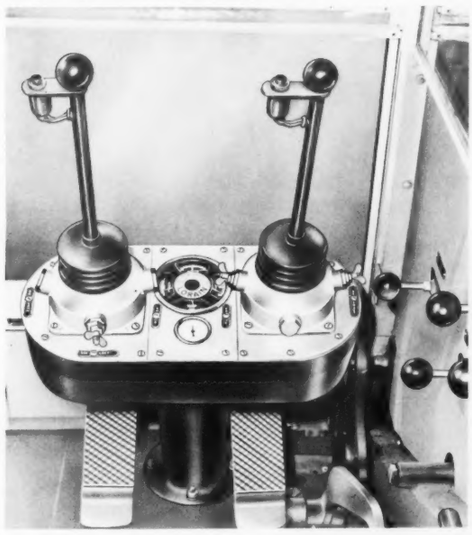
SQUARE-TUBULAR-CHORD BOOM PAYS OFF ON HOSPITAL CONSTRUCTION JOB. Vest and Bartell Company of Cincinnati, Ohio, puts the 25-ton Lorain-56 through its paces digging a 22-foot-deep basement and pouring concrete running wall.

Working with clamshell, dragline and concrete buckets, the square-tubular-chord boom provides capacity to spare. Made of special alloy steel, the boom is built with main chords of square tubing, lacings of continuous round tubing welded at common points to the chords. This creates an extra-strong "banding" effect.

"JOY-STICK" CONTROLS AND SHEAR-BALL MOUNTING BOOST OUTPUT. This job required using a 90-foot boom at times, at extra-wide radii—a real test for stability. Shear-Ball mounting provided a smooth, rock steady swing. "Joy-Stick" air power controls furnished easier, smoother response to cut operator fatigue. Results: faster operation, more work per day, better profits.

SHEAR-BALL MOUNTING eliminates center pin and nut, centering gudgeon, hook or top rollers, exposed roller path with their adjustment, lubrication and maintenance problems.

"JOY-STICK" CONTROLS require only two levers to apply "metered" air power to all turntable clutches for easier, simpler operation, increased production.



LORAIN®

THE THEW SHOVEL COMPANY, LORAIN, OHIO

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Co

a

Construction moves ahead faster with Lorains on the job

2½-YARD SHOVEL BEATS SCHEDULE ON 2200′ LONG ROCK CUT. Digging shale and sandstone with densities of up to 3,000 pounds per yard, this Lorain 85-A averages 2,000 yards each ten hour day working on the U. S. Highway 60 relocation job south of Charleston, West Virginia. With this and another 2½-yard Lorain, Boso and Ritchie, Inc. of Ravenswood, West Virginia have moved over 75% of the required 525,000 cubic yards in just over 50% of the time allotted for the project. Twenty-eight Lorains have paid off for Boso and Ritchie over the past 35 years.

SELF-PROPELLED CRANE HELPS ERECT GYM. In working on the construction of a high school gymnasium, Behlen Manufacturing Company of Columbus, Nebraska uses their versatile 7-ton SP-107 self-propelled crane to set steel and wall panels. John Mansback, operator, reports that he likes the hydraulic clutch controls. The SP-107 has full rated lifting capacities through 360 degree swing—no outriggers needed.

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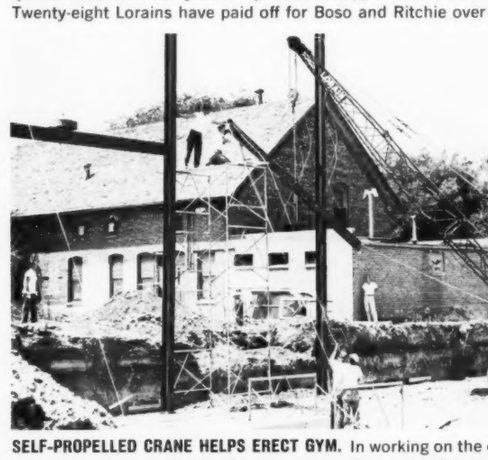

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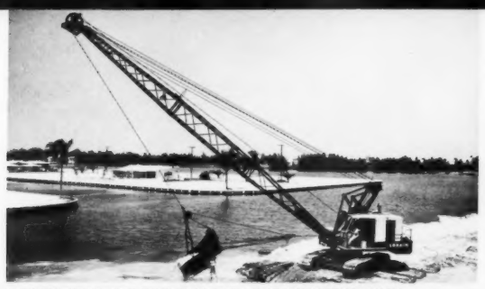

3-YARD DRAGLINE DIGS CHANNEL OUT OF CORAL ROCK. The job: digging 4½ miles of channels, 200 feet wide and 25 feet deep for a $75 million residential project in Florida. The rig: an 85-A owned by Layne, Inc. of Florida. The 70-foot boom, of Lorain's exclusive square-tubular-chord design, is lighter, stronger, permits operating with longer, flatter booms. Ideal for big dragline jobs.

2½-YARD CLAMSHELL SPEEDS CREEK DREDGING. Using a clamshell bucket on a 60-foot boom, this 85-A dredges a creek and establishes a gravel bed for a double box section concrete sewer. The 13th Lorain for W. L. Harper Construction Company of Cincinnati, Ohio, this crane has Shear-Ball mounting for "ball bearing" swings, "Joy-Stick" "metered" air clutch controls, lighter, stronger, square-tubular-chord boom.

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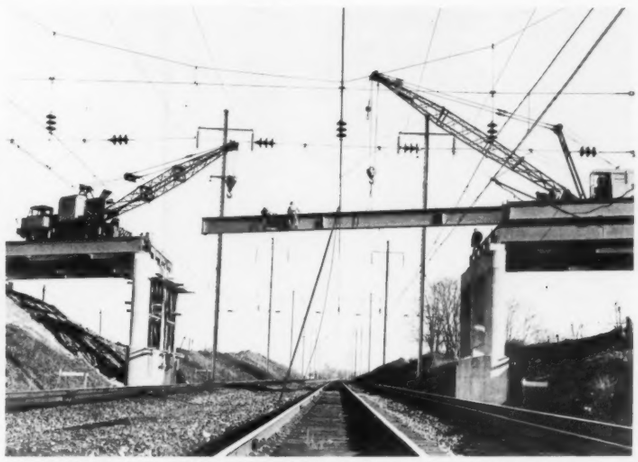
MOTO-CRANE DOES THREE JOBS FOR ONE PROJECT. Featuring Lorain's all-new rugged 8 x 4 carrier, this new, 30-ton MC-430 Moto-Hoe digs trenches and excavates foundations for a water treatment plant near Berkeley, California. Owner C. Norman Peterson, Inc. of Berkeley also uses this new Lorain as a crane for pouring concrete. Solid rocker beam front-axle bogie increases lifting capacities, gives better soft ground flotation, better axle loadings.

n working on the construction of a high Company of Columbus, Nebraska uses rane to set steel and wall panels. John e hydraulic clutch controls. The SP-107 degree swing—no outriggers needed.

17-TON CRANE HANDLES PRE-CAST CONCRETE BEAMS. McElroy Construction Company of Decatur, Illinois uses its Lorain-26 on an extra-wide crawler to place reinforced concrete beams on a highway bridge job. Equipped with a 50-foot boom and spreader sling, the "26" works at a 20-foot radius in handling the 6-ton lifts. The square-tubular-chord boom is stronger, though lighter to permit long reaches, increased capacities.



TWO LORAINS EASE I-BEAM BETWEEN WIRES. A 35-ton Lorain Moto-Crane teams up with a 30-ton Lorain Moto-Crane for precision handling of an I-beam for Aycock, Inc. of Camp Hill, Pennsylvania. This is the center section of a 177 foot span of a new bridge on the Lancaster-Reading highway. In addition to these two cranes Aycock owns another 30-ton Moto-Crane and a 22½-ton Moto-Crane.

Lorains speed work on $31,000,000 section of Ohio Throughway

35-TON MOTO-CRANE DRIVES 70-FOOT PILES FOR BRIDGE ABUTMENT SUPPORTS. One of three Lorains that Casey Construction Company of Pittsburgh, Pennsylvania uses to build five bridges, the MC-530W is equipped with a 75-foot boom to handle a hammer attachment and 50 feet of leads. Stanley Kraica, pile foreman, reports that the tandem front end of the Lorain carrier lets them "move easily over muddy terrain." Casey has purchased 19 Lorains.

A LORAIN HOE HELPS DIG OVER 11,000 FEET OF DRAIN PIPE DITCHES ranging from 8 to 10 feet deep. Harrison Construction Company, also of Pittsburgh, Pennsylvania is using five Lorains to move 1,700,000 yards of earth and for bridge building. C. E. Schreiber, assistant general superintendent reports that Harrison has standardized on Lorain because they are all 'round rigs that can handle both rock and dirt equally well. Harrison has purchased 57 Lorains.

WHEREVER THERE'S IMPORTANT CONSTRUCTION, YOU'LL FIND

LORAIN ON THE MOVE

its inside-out "umbrella". Cast-iron pipes under the floor slab carry the water away from the building.

The general order of construction was first, pour the caissons; second, pour the floor; third, go up with the columns; and last, build the shells.

The floor slab was completed early, permitting form scaffolding to be rolled from one column to another. After the four form sections were in place, the comparatively light network of reinforcing steel was wired together on top of the plywood shell.

Four groups of reinforcing containing No. 5 bars stemmed out from the central column. The heaviest steel in the shell was less than an inch in diameter. These No. 7 bars were set around the edges of the shell. The remaining surface was covered with a single layer of No. 3 bars on 1-foot centers both ways.

Lightweight concrete in shells

Lightweight concrete with Haydite aggregate was used in the roof sections. A P&H 255A motor crane bucketed the concrete from transit-mix trucks to the forms. After the mix was vibrated it was screeded and float-finished to a normal depth of 3 inches. Concrete in the four ribs which stem out from the column varies in thickness from 12 inches at the base to 4 inches at the outer edge. Specifications on the concrete called for a 2,500-pound break at 28 days.

The shells mushroomed up at the rate of one a day. A small crew stripped and set up the forms, and also completed the steelwork, in only half a day. During the afternoon, the concrete was poured and finished. The next morning the forms were stripped and the cycle repeated. This fast pace meant that 1,600 square feet of roof was built daily.

It also meant that building costs were being cut. The cost of the roof (including columns and built-up tar and felt cover) was $1.40 per net square foot. The cost of the completed building (including driveways and 58-car parking lot) was about $3.75 per square foot.

Personnel

Angus G. Wynne, Jr., is president of Great Southwest Corp. In charge of construction is project manager Luther D. Clark. His superintendent is Bill Christensen. THE END

American Cyanamid plans to move branch office

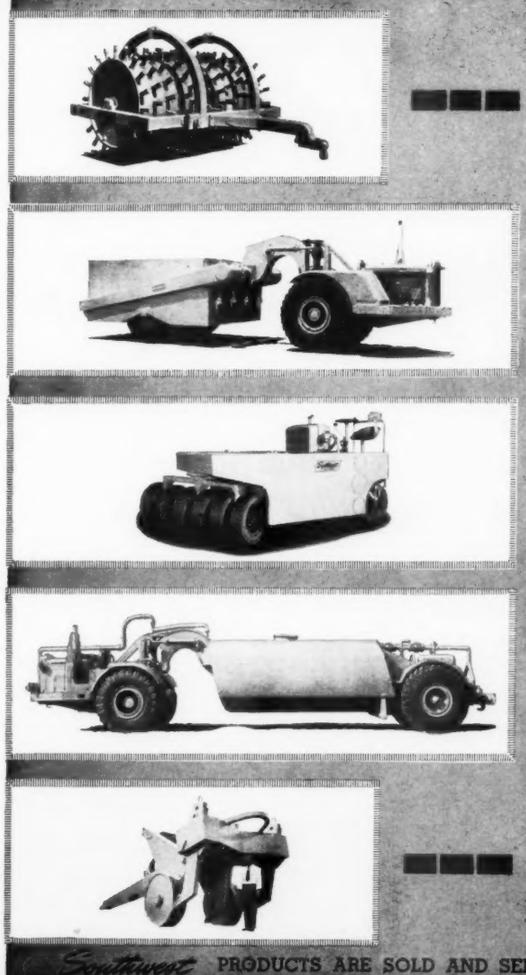
The Atlanta, Ga., branch office of American Cyanamid Co., New York City, will be moved this spring into a new building now being constructed in the Chamblee light-industrial area of that city. Cyanamid's new facility will be a one-story, 42,300-square-foot brick and steel structure on a 3-acre site. A 12,300-square-foot section will be used for office space, and the remainder will serve as a warehouse.

Branch sales and distributing activities for six divisions and one subsidiary will be consolidated in the new building.

HAULING OPERATIONS in the Antarctic are performed by a Sno-Cat powered by a Chrysler Industrial V-8 engine. The Sno-Cats, which have figured in many rescues in the Pacific Northwest, here have enclosed bodies and resemble small buses. In place of wheel there are two sets of buoyant pontoons and tracks or treads to insure mobility and positive traction in ice and snow.

Southwest

Compaction equipment for every earthmoving job



HEAVY DUTY SHEEPSFOOT ROLLERS

SOUTHWEST heavy duty, ARCH TYPE full oscillating Sheepsfoot Tamping Rollers meet U.S. Engineers', Bureau of Reclamation and State Highway compaction requirements. Two models are available—10 to 25 tons. Arch type frame unitizes front tongue and rear cross frame to remove pulling strains from oscillating pins. Equipped with the new FORGED, Southwest two piece feet with replaceable tips, or solid wedge-type feet. Timken bearings throughout. 1" drum shells. 60" drum diameters.

MULTIPLE BOX COMPACTION ROLLERS

SOUTHWEST multiple box, Pneumatic Compaction Rollers provide INDIVIDUAL VERTICAL OSCILLATION of wheels and weight boxes to assure uniform compaction regardless of soft spots, stones or boulders in the fill. No bridging or shifting of load from tire to tire because weight boxes oscillate independently. Contractors report TIRES LAST OVER 3 TIMES LONGER with multiple box type as compared to conventional single box design. Available in five models from 10 to 100 tons. Adaptable to any tractor.

VERTICAL-PAK SELF-PROPELLED ROLLERS

SOUTHWEST Vertical-Pak provides INDIVIDUAL VERTICAL OSCILLATION of rear wheels for the first time in self-propelled machines. Exclusive design affords uniform compaction on uneven surfaces, and new compaction efficiency. Seating arrangement and REVERSE-O-MATIC transmission place operator in a position to see both forward and rear operations. All five rear wheels powered through SELF-LOCKING differential chain drives.

SEMI-TRAILER SPRINKLER TANKS

SOUTHWEST Sprinkler Tanks are available in two models—5,000 and 6,000 gallon capacities—and may be adapted to any make two or four wheel tractor. Equipped with front and rear spray bars, plus gravity bar, these units provide a spray width up to 55 feet. The 6" self-priming centrifugal pump, with in-seat air-actuated controls, has a 1500 gpm capacity. Powered by 6-cyl. gasoline engine. Pressure bar nozzles are adjustable. Large tires assure adequate floatation.

HEAVY DUTY CABLE-OPERATED RIPPERS

SOUTHWEST heavy-duty Rippers are available in four sizes, from 5,000 to 25,000 pounds. Structural features, such as box beam sections of special design, are constructed to withstand the most severe job conditions. Predetermined and set angle of the three ripper shanks assure quick, positive penetration up to 48 inches. Special center shanks can be furnished for 60 inch penetration. Shanks are of special heat treated steel. Points are hardfaced and replaceable. Wheels are drum type, Timken bearing mounted. COMPACTION IS BEST WHEN YOU USE SOUTHWEST.

Southwest PRODUCTS ARE SOLD AND SERVICED BY YOUR CATERPILLAR® DEALER

CONSTRUCTION MACHINERY DIVISION
Southwest Welding & Manufacturing Co.
ALHAMBRA, CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 223

Hydraulic aerial lift speeds bridge bolting job on Connecticut Turnpike

A worker on the platform of the Skyworker Pole King tightens bolts on one of the eight overpass bridges on the Connecticut Turnpike. The bolts were loosely inserted in the assemblies and tightened after the concrete roadway was poured.

A unique problem in roadway work recently arose on the Connecticut Turnpike after crews had constructed eight interchanges and overpasses and placed assemblies for the eight bridges involved. Design specifications of the interchanges and overpasses, which were of the steel stringer and diaphragm type of beam construction, required that 8,000 high-strength bolts be inserted loosely into the assemblies before the concrete roadway was poured.

But the bolts had to be tightened after the concrete was poured. If tightened first, the extremely heavy weight of the concrete on the rigid steel frame would cause the frame to buckle, throwing the bridge out of shape. The job had to be done without walking over the road. The problem was to find some way of placing two men at the point of work from underneath the roadway.

A Skyworker Pole King, a truck-mounted hydraulic aerial lift, was brought in to do the job, eliminating the construction of costly cable rigging or the use of a crane. The rig, manufactured by Emhart Mfg. Co., Skyworker Division, Hartford, Conn., is equipped with two stabilizing outriggers, hydraulic lock-valves to prevent descent in the event of hydraulic line failure, and a self-leveling mechanism to keep the working platforms parallel to the ground. These factors, plus the fact that the Skyworker is equipped with a compressor, which makes possible the use of power tools on the working platforms, enabled the bolting job to be completed in two weeks.

Tractor-shovel firm stresses carry capacity

Pointing out that the basic part of tractor-shovel operation is the carrying of loads, even if only for a few feet per cycle, The Frank G. Hough Co. is stressing, in the rated specifications for its Payloaders, carry capacity at normal operating speeds.

The Model HO is reported to have a carry capacity of 9,000 pounds at 4 mph; the H-70, 7,000 pounds at 4 mph; and the HU, 5,000 pounds at 4 mph.

Bucket sizes can be chosen to suit the specific weight to be handled.

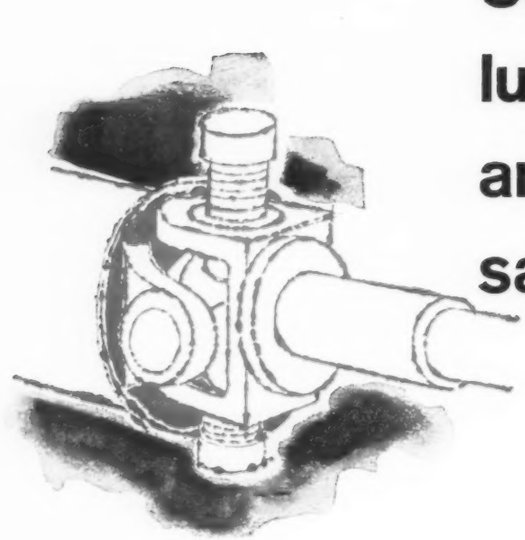
For further information write to The Frank G. Hough Co., Dept. C&E, 822 Seventh Ave., Libertyville, Ill., or use the Request Card at page 18. Circle No. 82.

Arc-welding foundation presents awards to five

Five engineering students at Cornell University received all of the top awards in this year's annual mechanical and structural welded design competition sponsored by The James F. Lincoln Arc Welding Foundation, Cleveland, Ohio.

The top award of $1,250 went to Richard Jarvis for his design of a triangular-shaped foot bridge. John Jenner and E. R. McLean shared the $1,000 second award for the mechanical design of an automatic welding machine. Gordon Kraus and Robert Spicher designed a display arboretum, which won the $500 third award. In honor of these awards, Cornell received $1,750 in scholarship funds.

The 1958–59 rules booklet for the current competition is now available from the foundation. Undergraduates in all branches of engineering are eligible to participate.



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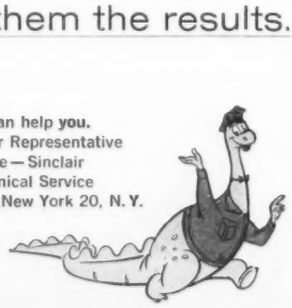

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Convention calendar

December 8–9 The Material Handling Institute, Inc.
Annual Meeting, Hotel Roosevelt, New York, N. Y. Hanson & Shea, Inc., managing directors, One Gateway Center, Pittsburgh 22, Pa.

December 10–11 National Construction Industry Conference
Fourth Annual Meeting, Sherman Hotel, Chicago, Ill. R. T. Majanovich, conference chairman, NCIC, Armour Research Foundation, 10 W. 35th St., Chicago 16, Ill.

December 11–12 Surveying and Mapping Conference
Third Annual Meeting, Union Bldg., University of Utah, Salt Lake City, Utah. Clifford G. Bryner, conference chairman, SMC, Civil Engineering Department, University of Utah, Salt Lake City 12, Utah.

January 5–9, 1959 Highway Research Board
Annual Meeting, Sheraton-Park Hotel, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave., Washington 25, D. C.

January 8–10 Associated General Contractors of Minnesota
Annual Meeting, Leamington Hotel, Minneapolis, Minn. R. J. Hendershott, manager, AGCM, 910 Builders Exchange Bldg., Minneapolis 2, Minn.

January 14–15 The Beavers
Awards Meeting, Biltmore Hotel, Los Angeles, Calif. J. W. Watson, assistant secretary-treasurer, The Beavers, 3932 Wilshire Blvd., Los Angeles 5, Calif.

January 19–22 American Road Builders' Association
Fifty-seventh Annual Convention and Materials and Service Exhibit, Dallas Memorial Auditorium, Dallas, Texas. Norman T. Almquist, administrative services manager, ARBA, World Center Bldg., Washington 6, D. C.

January 19–23 Associated General Contractors of America
Annual Meeting, Americana Hotel, Miami Beach, Fla. James D. Marshall, executive director, AGC, 20th and E Sts. N. W., Washington 6, D. C.

January 25–29 Associated Equipment Distributors
Fortieth Annual Convention, Conrad Hilton Hotel, Chicago, Ill. W. G. Bowman, administrative assistant, AED, 30 E. Cedar St., Chicago 11, Ill.

January 26–28 Association of Asphalt Paving Technologists
Annual Meeting, Brown Palace Hotel, Denver, Colo. Ward K. Parr, secretary-treasurer, AAPT, 1224 E. Engineering Bldg., University of Michigan, Box 619, Ann Arbor, Mich.

January 26–29 Plant Maintenance and Engineering Show
Exhibit, Public Auditorium, Cleveland, Ohio. Banner & Greif, 369 Lexington Ave., New York 17, N. Y.

January 27–30 National Crushed Stone Association
Annual Meeting, Americana Hotel, Miami Beach, Fla. J. R. Boyd, executive director, NCSA, 1415 Elliott Place N. W., Washington 7, D. C.

January 28 The Moles
Award Dinner, Waldorf-Astoria Hotel, New York, N. Y. The Moles, Biltmore Hotel, New York 36, N. Y.

January 28–29 Midwest Welding Conference
Fifth Annual Conference, Chemistry Building, Illinois Institute of Technology, Chicago, Ill. Harry Schwartzbart, supervisor of welding research, Armour Research Foundation, 10 W. 35th St., Chicago 16, Ill.

January 28–30 New York State County Highway Superintendents Association
Meeting, DeWitt Clinton Hotel, Albany, N. Y. Harry R. Mason, secretary, NYSCHSA, Fonda, N. Y.

January 29 Maryland Association of Engineers
Meeting, Lord Baltimore Hotel, Baltimore, Md. Louis B. Kravetz, executive secretary, MAE, 314 Municipal Bldg., Baltimore 2, Md.

February 2–6 National Bituminous Concrete Association
Fourth Annual Convention, Americana Hotel, Miami Beach, Fla. H. K. Griffith, executive director, NPCA, 1145 19th St. N. W., Suite 218, Washington 6, D. C.

February 9–13 American Society of Civil Engineers
Convention, Hotel Statler, Los Angeles, Calif. Don P. Reynolds, assistant to the secretary, ASCE, 33 W. 39th St., New York 18, N. Y.

February 16–19 National Ready Mixed Concrete Association and National Sand and Gravel Association
Twenty-ninth Annual Convention of the NRMCA, and the Forty-third Annual Convention of the NSGA, Roosevelt Hotel, New Orleans, La. Vincent P. Ahearn, executive secretary, NRMCA-NSGA, 527 Munsey Bldg., Washington 4, D. C.

February 23–26 American Concrete Institute
Fifty-fifth Annual Convention, Statler-Hilton Hotel, Los Angeles, Calif. William A. Maples, secretary-treasurer, ACI, P. O. Box 4754, Redford Station, Detroit 19, Mich.

Two-year research work begins on AASHO Road Test

Sixty trucks have started rolling over the American Association of State Highway Officials' Road Test, northwest of Ottawa, Ill. Traveling on five test loops built along the 8-mile right-of-way, the trucks will run about 18 hours a day, six days a week for the next two years.

The test pavements on the $22 million highway research project are concrete and asphalt, and are built in a wide range of thicknesses. The test vehicles range from pick-up models with 2,000-pound loads on single axles up to huge tractor semi-trailers with 48,000-pound loads on tandem axles.

During the 2-year traffic period, scientists, engineers, and technicians from the Highway Research Board's test-road staff will record data on the behavior of the pavements under traffic.

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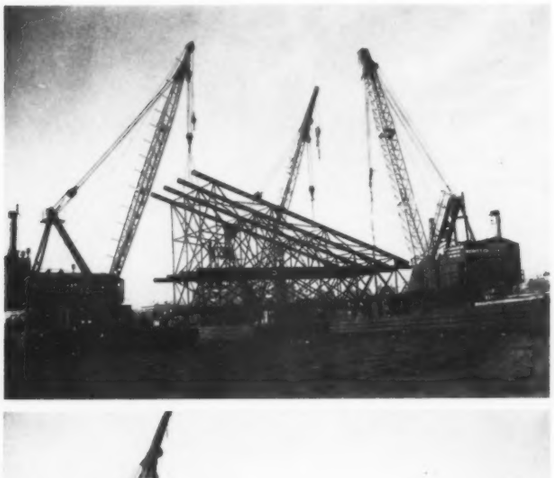
At the site of the Bronx tower pier for the Throgs Neck Bridge, three American derrick cranes lift one of the steel cages that will guide the caisson as it is sunk into place to form the base for the pier.



After the barge is removed and the cage comes to a plumb position, the crane in the middle is released. The derricks at either side then begin lowering the cage to the river bottom.

Cages are permanently tied to the river bottom by steel piles being dropped through the pipes by an American derrick. Here, three cages are in position, ready for the cutting edge to be floated into place.

M-C&S begins placing the outside skin plate and digging wells. This cutting edge for the Bronx side was floated to the tower location without sidewalls or digging wells.

Big floating rigs team up at Throgs Neck in

Sinking caissons for tower piers

by ANTHONY N. MAVROUDIS
field editor

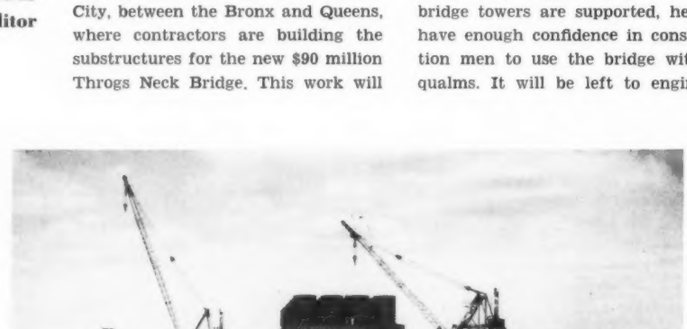
Probably the most interesting phase of bridge construction is now under way in the East River in New York City, between the Bronx and Queens, where contractors are building the substructures for the new $90 million Throgs Neck Bridge. This work will be hidden below the water surface forever and, though the average motorist may wonder how the huge bridge towers are supported, he will have enough confidence in construction men to use the bridge without qualms. It will be left to engineers and contractors, who know what is involved in making the bridge a reality, to fully appreciate the work.

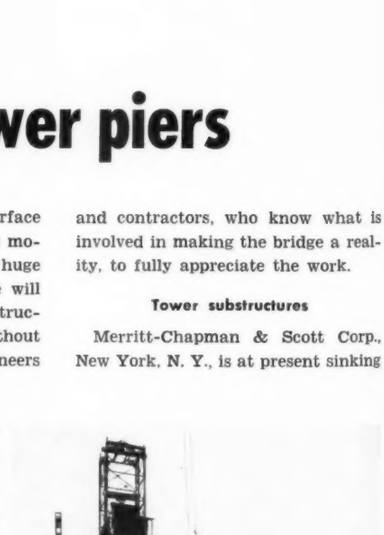
Tower substructures

Merritt-Chapman & Scott Corp., New York, N. Y., is at present sinking

The caisson begins to take on final form as two American 50-ton derrick cranes with 125-foot booms erect skin plate and digging-well steel. Outside skin plate is welded inside and out; the 36 digging wells, of 14-foot diameter, are bolted.

A floating batch plant turns out concrete for the pair of tower piers. A Wiley derrick crane with 2-yard clamshell, left, charges the Johnson aggregate bin. American derricks fill Gar-Bro 4-yard buckets at the wet-batch hopper and swing them to pours.

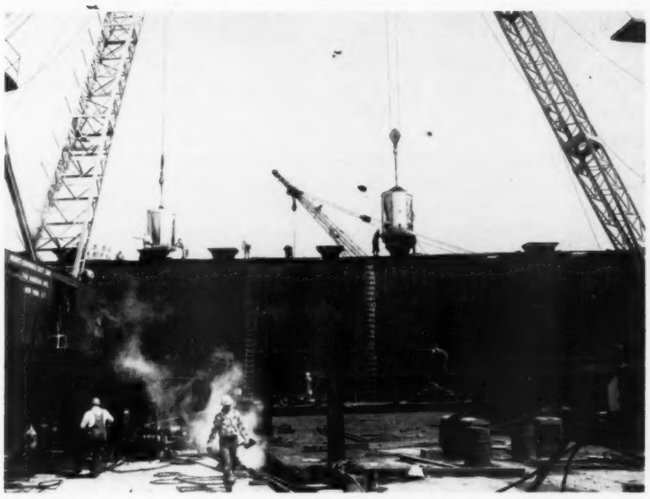




Mixed concrete is raised up a 70-foot tower and dumped to hopper that feeds the enclosed transfer chute. The chute delivers concrete to the 10-yard wet-batch hopper.

The $90 million Throgs Neck Bridge, scheduled for completion in January, 1961, is part of a $750 million program of the Triborough Bridge and Tunnel Authority and the Port of New York Authority to provide vehicular routes bypassing Manhattan. The new structure, which parallels the Bronx-Whitestone Bridge, will provide an additional link between the expressway systems of the Borough of the Bronx and Long Island.

An article on caisson fabrication will appear next month.



Pours are made by American derrick cranes with Gar-Bro 4-yard buckets via hoppers spaced throughout the caisson area. Hoppers have 40-foot-long 12-inch-diameter pipes to direct the fall of concrete, and these can be extended by adding 3½-foot sections to maintain the desired free fall of concrete.

two steel caissons to form the tower-pier foundations. The two cable anchorages are being built under separate contracts with other contractors. M-C&S started work on this $7,500,000 substructure contract in March and is scheduled to complete the work next April. This schedule meant that the contractor needed a large floating equipment fleet to work on the two caissons simultaneously. The water is about 60 feet deep at the Bronx tower and 80 feet deep at the Queens tower. The bridge will be 2,910 feet long, measured between anchorages, with a center span of 1,800 feet between the tower piers.

Merritt-Chapman & Scott began operations on the Bronx caisson while the Queens caisson was being fabricated. Each caisson has a 162×75-foot rectangular cutting edge, resembling a giant cookie cutter, which will be forced into the river bottom.

Float edge in

The Bronx cutting edge was floated to the tower location from the fabricating yard in Yonkers without any sidewalls or digging wells installed. The Queens caisson was towed to the project site with various heights of skin plates and digging wells ranging from 24 to 56 feet already installed atop the cutting edge.

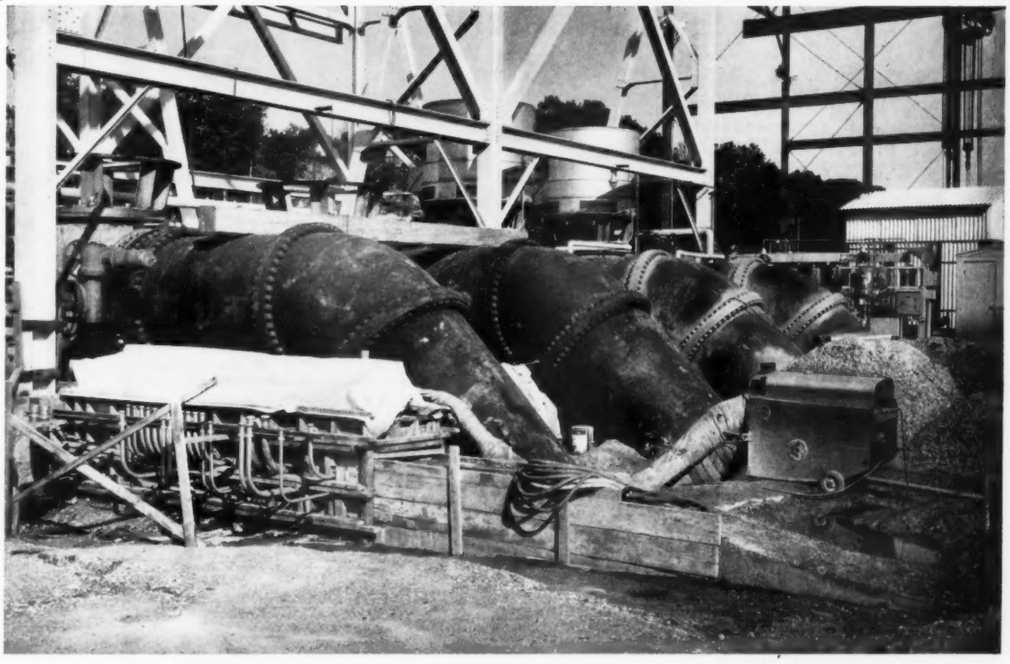
The cutting edge consists of four walls made up, in cross section, of two steel plates 5 feet apart for a depth of 6 feet. For the remaining depth of the 13-foot-deep walls, the inside plate is tapered to form the desired wedge-shaped cutting edge.

The four cutting-edge walls are braced longitudinally and transversely by built-up steel sections. This entire 162×75-foot area is topped with a steel plate in which 36 circular openings 14 feet in diameter are cut. These openings, spaced in four rows of nine each, provide the openings in the cutting edge corresponding to the digging wells erected for the caisson. Hollow, sealed perimeter walls gave the Bronx cutting edge buoyancy.

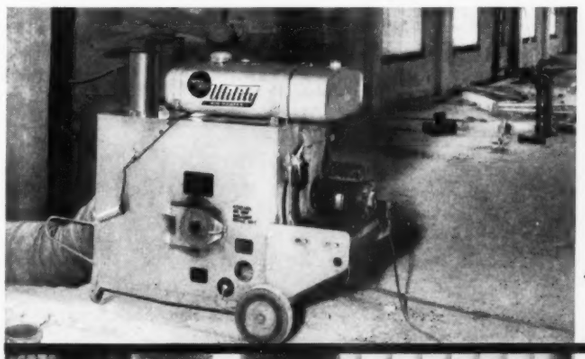
Cages align caisson

The Bronx cutting edge was floated to the site and locked into steel cages which had been positioned to guide the caisson during its descent. The same was done when the Queens caisson was delivered to its site.

(Continued on next page)



15 HERMAN NELSON "De Luxe" heaters were used in building a new Yorktown plant addition for Virginia Electric & Power Company. Heaters were operated continuously day and night, in mud, rain and snow. They were used for curing concrete, and to protect valves and piping during construction. Contractor is Stone & Webster Engineering Corporation.



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(*Continued from preceding page*)

These cages consist of twelve pipes in three rows, two vertical and one on a batter, interlaced with steel bracing. The cages were prefabricated and barged out to location between two derrick barges. Three American 50-ton derricks were required to position cages making up the caisson enclosure. Two derricks, one on each side of a cage, were connected to the sides of the cage, while the third was hooked to the bottom of the cage. After the cage was lifted off the barge and the barge was removed, the middle derrick holding the bottom let out cable to plumb the cage. The middle derrick was then removed, allowing the two side derricks to lower the cage to the river bottom. The correct cage positioning was done by aligning the derrick barges with transit fixes.

Once the cage had been correctly positioned, four steel piles were driven through the corner pipes of the vertical rows. The cage was then pinned to the piles, allowing M-C&S to release the two side derricks. Three cages were set in this manner to form a 3-sided enclosure so that the caisson could be floated in. After the caisson was slipped into position, the fourth cage was placed to completely restrain the caisson on four sides.

The Queens cages consist of 20-inch-diameter pipes on 13-foot centers between the four pipes per row. The Bronx cages are made up of 18-inch-diameter pipe sections and are about 75 feet high. The Queens cages are about 102 feet high, because of the greater water depth, and they required larger and heavier sections. The outside row of pipes is on a 1 to 5 batter.

Piles driven

Steel H-piles were driven through each cage pipe to tie them securely to the river bottom and prevent any deviation of the caisson while work progresses. A McKiernan-Terry 10-B-3 steam-operated hammer drove the 14-inch H-piles to the ultimate founding depths of the caissons—135 feet on the Bronx side and 155 feet on the Queens side. This resulted in a penetration of about 75 feet into the river bottom.

Once the Bronx cutting edge was enclosed by the cages on each side, M-C&S began forming the outside skin plate and placing the 36 digging wells to build up the caisson. The skin-plate lifts vary in height but exactly match the lifts of the digging wells. Each 14-foot-diameter digging-well section is bolted by 183 bolts, ¾ inch in diameter, spaced on 3-inch centers around the circumference at each lift. Gaskets make these bolted flange connections watertight. M-C&S is using Chicago Pneumatic impact wrenches, powered by six barge-mounted Ingersoll-Rand 500-cfm air compressors, to tighten the bolts.

The fabricated ⅜-inch-thick skin-plate sections are welded, both inside and out, to form the walls of the caisson. M-C&S has a welding barge equipped with 30 Miller 300-amp electric welding machines, powered by three Murphy diesel-generating sets, to feed the many welders on the job. The skin plates are braced, in both directions, by wide-flange struts welded to the skin plate with knee bracing. These struts, spaced about 10 feet measured vertically, box in the digging wells in each direction.

This in-place fabrication of the caissons is being done in various lift heights. The weight of the additional lift steel alone causes the caissons to sink. After completing a lift of wells and walls, M-C&S is placing concrete around the wells in order to increase the weight of the caisson. This sinks the caissons further and maintains a maximum freeboard of about 10 feet. It requires about 200 tons of weight—in this case a combination of steel and concrete—to sink the caisson 1 foot.

M-C&S is maintaining a 10-foot freeboard to facilitate the placing and welding of subsequent lifts from the surrounding barges. This 10-foot height is enough to keep the caisson from sinking below the freeboard level as additional weight is placed.

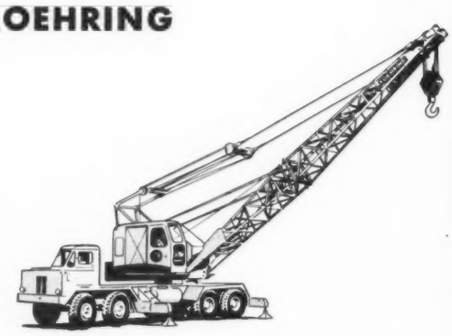
Excavation started

After the cutting edge reached the river bottom, M-C&S had to begin digging in order to continue sinking the caisson. This excavation is now being done through the digging wells by the barge-mounted American derricks equipped with clamshell buckets.

The work involves placing the wall and digging-well lifts; pouring concrete around the digging wells; and excavating the material beneath the caissons. These operations are done in various sequences to sink the caisson lifts to the 10-foot freeboard level.

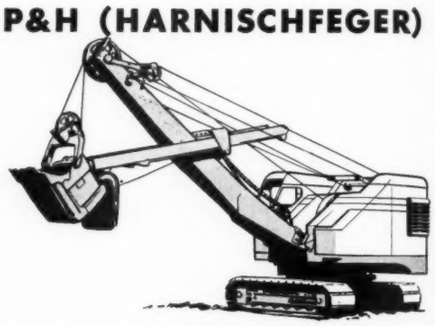
The outside skin plate and the digging wells are being prefabricated and placed in exactly the same lift heights. These vary from 16 feet to 34 feet to accommodate the different concrete pours scheduled between lifts. This sequence of operations will continue until the skin friction developed will be such that the caissons cannot sink any further. Because of the difference in water depth at the Bronx and Queens locations, the Bronx caisson will be sunk about 135 feet below water level and the Queens

KOEHRING



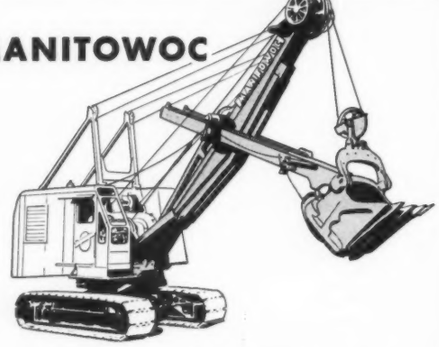
Koehring Model 445 Truck Crane (45 tons) . . . available with a Twin Disc 1500 Series Single-Stage Torque Converter.

P&H (HARNISCHFEGER)



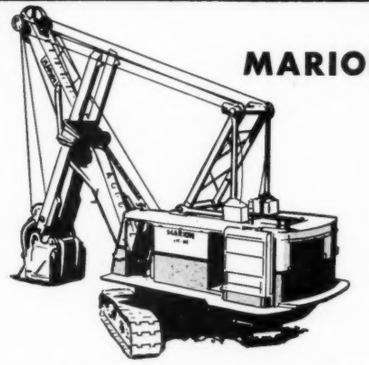
P & H (Harnischfeger) Model 655B with 1½-yard bucket, available with a Twin Disc 11,500 Series Three-Stage Torque Converter. P & H also offers 3½-yard 1055 Series with Twin Disc 13,800 Series Torque Converter.

MANITOWOC



Manitowoc Model 3600 Shovel with 3-yd. bucket . . . offered with a Twin Disc 10,000 Series or 11,500 Series Three-Stage Torque Converter. Six other Manitowoc Models are available with Twin Disc Three-Stage Torque Converters.

MARION



Marion Type 111-M Shovel with 4-yd. bucket, offered with a Twin Disc 11,500 Series Three-Stage Torque Converter. Six other Marion Models, from ¾ through 3 yds., available with Twin Disc 10,000 Series Three-Stage Torque Converters.

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- Standardization of Torque Converters reduces maintenance problems . . . slashes spare parts inventories . . . saves time and money.
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- On a shovel, they deliver up to twice normal torque to the drum—an important advantage in power delivered at slow digging speeds.
- On a crane or clamshell arrangement, they permit safe, accurate control of loads and delicate inching and holding under power.
- They provide an infinite variety of torque ratios . . . automatically and instantaneously . . . according to load demands.

caisson 155 feet below water level to obtain the desired friction. No rock is anticipated during this operation.

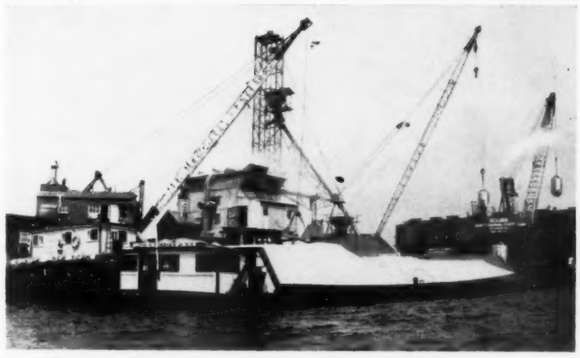
When the caissons reach their founding depths, the contractor will place a tremie pour through the digging wells to fill the area under the caissons and inside the 13-foot-deep cutting edges. The tremie pour will be extended about 1 foot up into each digging well to form a watertight seal at the bottom of the wells. This tremie pour will be done after the concrete around the wells is at an elevation of minus 22 feet.

During the tremie pour, the water in the digging wells will be pumped out to keep it from overflowing into the caisson. A concrete cap will be built over the caissons to completely seal the water in the digging wells and form a base for the bridge's tower piers. The sealing in of the incompressible water will allow the caissons to act as complete solid foundations.

Two-mixer plant

Merritt-Chapman & Scott is using a floating batch plant, operating at near its rated capacity of 120 yards per hour, to produce the 78,000 cubic yards of concrete for the pair of tower piers. The plant is designed and laid out to produce a continuous flow of concrete.

The floating plant consists of a Johnson aggregate bin and two Ransome 2-yard mixers. Johnson scales and controls, operated by a push-button control panel, make the plant automatic, but supplementary controls permit manual operation. This 2-way operation allows continuous plant production in case of a breakdown in the automatic controls.



Material barges supplying stone, traprock, and cement to the plane are moored at the batch-plant barge. The plant has provision for both automatic and manual operation so that production will be continuous in case of a breakdown in the automatic controls.

Aggregates, consisting of ¾-inch stone, 1½-inch traprock, and sand, are supplied to the plant from material barges moored alongside the plant barge. A Wiley derrick, equipped with a 2-yard clamshell bucket, is also mounted on the plant barge to charge the aggregate bin. Cement, delivered to the site in enclosed barges, is charged into the cement compartment of the plant by a Fuller-Kinyon air pump.

Each mixer, after completing its mixing cycle, dumps into a 2-yard receiver that is raised up a 70-foot tower by a single-drum American hoist. The 2-yard hoist bucket is tripped near the top of the tower, causing the concrete mix to empty into a 2-yard hopper feeding the enclosed transfer chute. This chute, supported by cables and a boom off the tower, is used to charge concrete into a contractor-built 10-yard wet-batch hopper located on a barge that is sandwiched between two derrick barges.

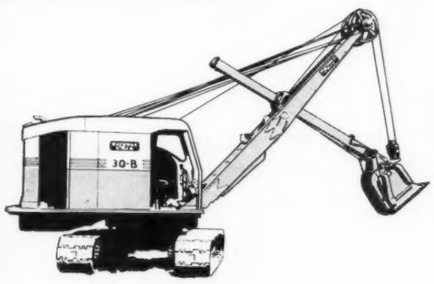
A man at the top 2-yard tower hopper controls the flow of concrete into the chute. A signal bell permits this operator to notify the batch-plant operator not to hoist any more concrete. This happens only when the 10-yard wet-batch and tower hoppers are full. In this case, the plant operator keeps the mixers from dumping into the hoist bucket until the go-ahead signal is given by the tower-bucket operator. Electric power for the plant operation is supplied by a generating unit located on the barge.

Derricks handle buckets

M-C&S is using Gar-Bro 4-yard air-operated concrete buckets, handled by the two barge-mounted American derricks straddling the wet-batch hopper, to place the concrete in the caissons. The wet-batch hopper charges the buckets through two side chutes. The chute gates are activated by Schrader double-acting air rams controlled by levers on each side of the hopper. These controls are powered by an air compressor mounted on a derrick barge.

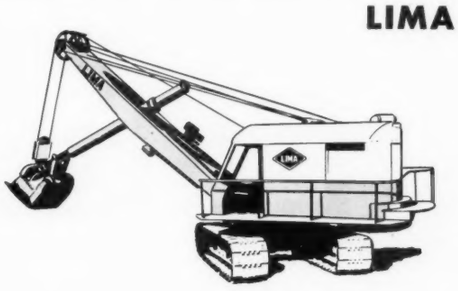
The two American derricks handling the concrete placement use 125-

BUCYRUS-ERIE



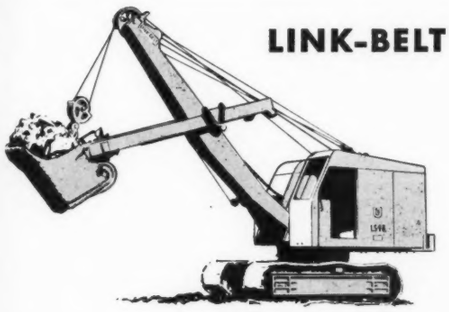
Bucyrus-Erie Model 30-B Shovel with 1-yard bucket . . . available with a Twin Disc 10,000 Series Three-Stage Torque Converter.

LIMA



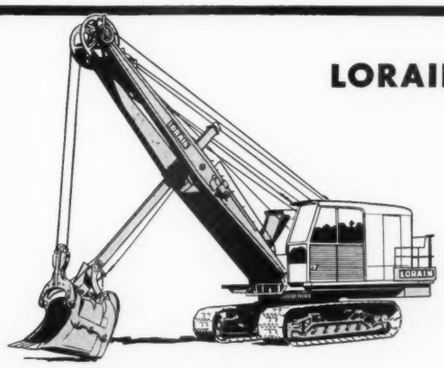
Lima Type 703 Shovel with 1¾-yd. bucket . . . available with a Twin Disc 10,000 Series Three-Stage Torque Converter, which is also offered on Lima Type 803 2½-yd. Shovel. Other Lima products offer Twin Disc Torque Converters and PTO's.

LINK-BELT



Link-Belt Speeder Model 98 with 1-yd. bucket . . . available with a Twin Disc 1500 Series Single-Stage Torque Converter.

LORAIN



Lorain-85A Shovel with 2½-yd. bucket . . . offered with a Twin Disc 10,000 Series Three-Stage Torque Converter. Twin Disc also available on Lorain-26 Model ¾-yard Shovel.

converter tractor!

• They extend cable life, cut cable costs . . . by eliminating sharp impact loads . . . by providing constant line tension without dangerous snapping or jerking.

Twin Disc Torque Converters—three-stage or single-stage, from 30 to 1000 hp—are available from all leading excavator manufacturers. Specify one in your next machine. See for yourself why users throughout industry say: A Twin Disc Torque Converter is the wisest investment you can make when buying heavy-duty machinery.

TWIN DISC CLUTCH COMPANY
Racine, Wisconsin
Hydraulic Division, Rockford, Illinois

For more facts, use Request Card at page 18 and circle No. 227

ASPHALT FOR HIGHWAY CONSTRUCTION, airfields, ordnance depots, and other jobs handled in northern Indiana by Brooks Construction Co., Fort Wayne, is turned out in the firm's newest plant, a portable Standard Steel Model R-M. Trailers, left, carry generators to supply power for the unit. One takes care of the mixer, screen, hot elevator, air compressor, dust elevator, pump, dust worm, and aggregate elevator. The other handles the fan and dryer, blower, heater, feeders, and cyclone screen.

(Continued from preceding page)

foot booms in order to reach the many hoppers spotted over the caisson. The hoppers, supported by the cross bracing around the digging wells, have 40-foot-long, 12-inch-diameter pipes to direct the fall of the concrete being placed. If the pipe has to be extended to maintain a maximum free fall of 10 feet, crews add 3½-foot removable sections.

M-C&S is working on both caissons simultaneously with the single plant. The plant is moved back and forth between the caissons as succeeding lifts of skin plate and digging wells are erected. The contractor is using four American 50-ton derricks to handle the caisson erection and the concrete placing on the project.

Personnel

Merritt-Chapman & Scott's construction operations on the Throgs Neck Bridge project are under the over-all supervision of Frank R. Creedon, construction manager. Grover C. Denny is the project manager, and Jack Y. Denny, the general superintendent, heads the field staff for M-C&S.

Nomar Gray is the project engineer and Bill Delahanty, the resident engineer, for Amman & Whitney, New York, N. Y., the consulting engineers for the Triborough Bridge and Tunnel Authority. The consultants also have the inspection responsibilities of the project, from anchorage to anchorage. THE END

(A companion article appears on page 54.)

Dravo personnel news

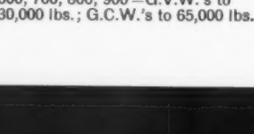
Robert Hughes has been appointed director of research and development of Dravo Corp., Pittsburgh, Pa., succeeding W. L. Newhall, who has retired. Dr. John A. Anthes has been named assistant director.

D. R. Berg is manager of the new-product development department. A 20-year member of the firm, Berg was project manager for Dravo during the installation of the nuclear portion of the Shippingport Atomic Power Station, and most recently supervised product development for the company's Machinery Division.

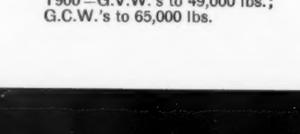
Now is the time to dr

DODGE A

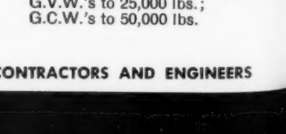
New '59 Dodge Power Giants, "Job-Rated" for ever



CONVENTIONAL Models 400, 500, 600, 700, 800, 900—G.V.W.'s to 30,000 lbs.; G.C.W.'s to 65,000 lbs.



TANDEM Models T700, T800, T900—G.V.W.'s to 49,000 lbs.; G.C.W.'s to 65,000 lbs.



C.O.E. Models C500, C600, C700—G.V.W.'s to 25,000 lbs.; G.C.W.'s to 50,000 lbs.

4-WHEEL-D
W200, W30
G.V.W.'s to

Avoid legal pitfalls

Haulage contractor's insurance coverage

THE PROBLEM: *A haulage contractor, acting for a road contractor, hauled a load of stone screenings to the hopper of a concrete products company. On a previous trip, he had hauled a load of riprap, some of which was not unloaded when the truck body was elevated to dump. When the screenings were unloaded, large pieces of riprap also went into the hopper, damaging the concrete company's conveyor system. The haulage contractor carried a liability insurance policy covering the truck while used in hauling exclusively for the road contractor. Was the insurance company liable for the damage to the conveyor system?*

THE ANSWER: Yes. (Hudson River Concrete Products Corp. v. Callanan Road Improvement Co., 168 N. Y. Supp. 2d 801, decided by the New York Supreme Court, Appellate Division, Third Department.)

The court decided that the haulage contractor was negligent in that he knew, or ought to have known, that the pieces of riprap, mixed with the screenings, would damage a conveyor system not adapted to receiving them. The damage must be regarded as having been "accidentally" caused within the policy's coverage.

Liability for inducing party to break contract

THE PROBLEM: *A manufacturer had a contract with the owner of a building under construction for installation of special fixtures in the building. If the building contractor and his agent wrongfully conspired to induce, and did induce, the owner to break that contract, were they liable for resulting loss sustained by the manufacturer?*

THE ANSWER: Yes. (Pilurs v. Elco Construction Co., 149 N. E. 2d 104, decided by the Illinois Appellate Court, First District, Chicago.)

In law, a "conspiracy" is a combination or agreement between two or more parties to injure a third party by an unlawful act or by using unlawful means to accomplish a lawful act.

One who has induced a breach of contract, with accomplished intent to injure the aggrieved party to the contract, cannot escape liability for resulting damages, on the ground that the aggrieved party could have sued the other party to the contract for breaking it.

In such cases the conspirators are jointly and separately liable for the resulting damage.

Surety liable on bid bond

THE PROBLEM: *A school district project contemplated construction of three buildings. The notice to bidders stated: "Bids will be taken on the basis of a single contract for each building . . . and a combined bid may be submitted for the three buildings to be built under one contract." The notice required that "a bid guaranty shall be submitted with each bid in an amount equal to five per cent of the bid", either in the form of a certified check or "approved bid bond"—the check or bond to be considered as liquidated damages "for the failure of a bidder to whom a contract is awarded to execute the contract documents and surety bond".*

A contractor bid on each building and on all three. A bid on one building was accepted, but the bidder was unable to furnish a performance bond and the work was awarded to a higher bidder. The first bidder had given one bond to secure entry into a contract covering "a proposal for school buildings". The district sued the surety for the increased cost of the one building covered by the alternative bid, which was accepted but not fulfilled. Was the surety liable?

THE ANSWER: Yes. (Bolivar Reorganized School District v. American Surety Co., 307 S. W. 2d 405, decided by the Missouri Supreme Court.)

The court said that the wording of a surety's undertaking cannot be stretched to impose liability not contemplated by his contract. But here the surety was bound by the bidding specifications and instructions which permitted alternative bidding, whether aware of those conditions or not. Furthermore, the surety had entrusted the bond to the bidder with blanks left to be filled in by the latter in respects not conflicting with the terms of the bond as entrusted to him.

However, the court decided that the circumstances were such as to have raised enough doubt as to the surety's liability as to exempt it from a statutory penalty and liability for the district's attorneys' fees on

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Edited by A. L. H. STREET
Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

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WHERE THEY COUNT!
New performance!
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Look into the cab—look into the chassis! Wherever you look in the new 1959 Dodge trucks, you'll find changes that *mean something*. New convenience, for instance, in suspended brake and clutch pedals, and hydraulically operated clutch. New heavy-duty electrical system. Greater dependability. Increased G.V.W.'s on tandems. Concealed running boards on medium-tonnage models.

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Ask your dealer about all the new Power Giant advancements. And about the new network of Dodge Truck Centers that let him give quick delivery of any Dodge truck to meet your exact needs. Plus hurry-up parts service. See him soon!

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Striking new Dodge low-tonnage models! This spirited new Sweptline Pick-up leads a complete line of new 1959 Dodge low-tonnage trucks. Advanced models for every need, from 5,100 to 10,000 lbs. maximum G.V.W.

for every trucking need

4-WHEEL-DRIVE Models W100, W200, W300, W300M, W500—G.V.W.'s to 20,000 lbs.

FORWARD-CONTROL Models P300 and P400 G.V.W.'s to 15,000 lbs.

TODAY . . .
IT'S REAL SMART
TO CHOOSE DODGE
POWER GIANTS

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the ground that it had vexatiously refused to pay its just obligation as surety. So the Supreme Court allowed the district judgment for damages sued for, plus interest, but struck from the judgment an $828.32 penalty and $2,500 attorneys' fees, which had been allowed by a lower court.

Quarry owners sue lessee

THE PROBLEM: *A recorded quarry lease was to run from 1924 to 1974. Title to the land, subject to the lease, passed from owner to owner. Could the current owners hold the lessee corporation liable in damages for removing quarried materials on a theory that the leasehold rights had been abandoned—the only basis for the claim being nonpayment of real estate taxes and an alleged statement by the company's superintendent of employees that the lease had been abandoned?*

THE ANSWER: No. (Cordell v. Grove Stone & Sand Co., 102 S. E. 2d 138, decided by the North Carolina Supreme Court.)

The court said that (1) under state law the leasehold was not subject to taxation, apart from the land itself, and that (2) one employed to supervise his employer's operations has no implied authority to bind his employer by an assertion that the latter has abandoned property rights.

Taxes on f.o.b. deliveries

THE PROBLEM: *A California manufacturer of cement blocks had separate prices according to whether delivery was made f.o.b. its plant or at a destination designated by the buyer. Were sales taxes assessable on the total price charged for block delivered at the buyer's destination, although the manufacturer regarded the differential as a delivery charge?*

THE ANSWER: Yes. (O'Kelley-Eccles Co. v. State, 324 Pac. 2d 683, decided by the California District Court of Appeal, Third District.)

The case turned upon the wording of California statutes, and the decision resulted in the manufacturer having to pay not only a sales tax on that part of the charge covering

For more facts on Insert, circle No. 230→

delivery, but also a transportation tax on use of trucks for making delivery.

Collusive bidding

THE PROBLEM: *Customarily, defendant was plaintiff's subcontractor on various jobs. Plaintiff sued defendant for breach of an alleged agreement, by defendant, not to bid on a particular job. Was plaintiff entitled to collect damages?*

THE ANSWER: No. (Kimball Elevator Co. v. Elevator Supplies Co., 272 Pac. 2d 583, decided by the Utah Supreme Court.)

The court decided (1) that plaintiff failed to prove defendant had agreed not to bid; (2) that there may be a bona fide agreement that one will refrain from bidding on a prime contract in exchange for assurance that the other party, if awarded the prime contract, will award him a subcontract; but (3) that an agreement is void, as being fraudulent against the owner calling for bids, if the agreement contemplates that one of two bidders will bid so high as to insure the other securing the contract.

Contracting powers of contractor's agents

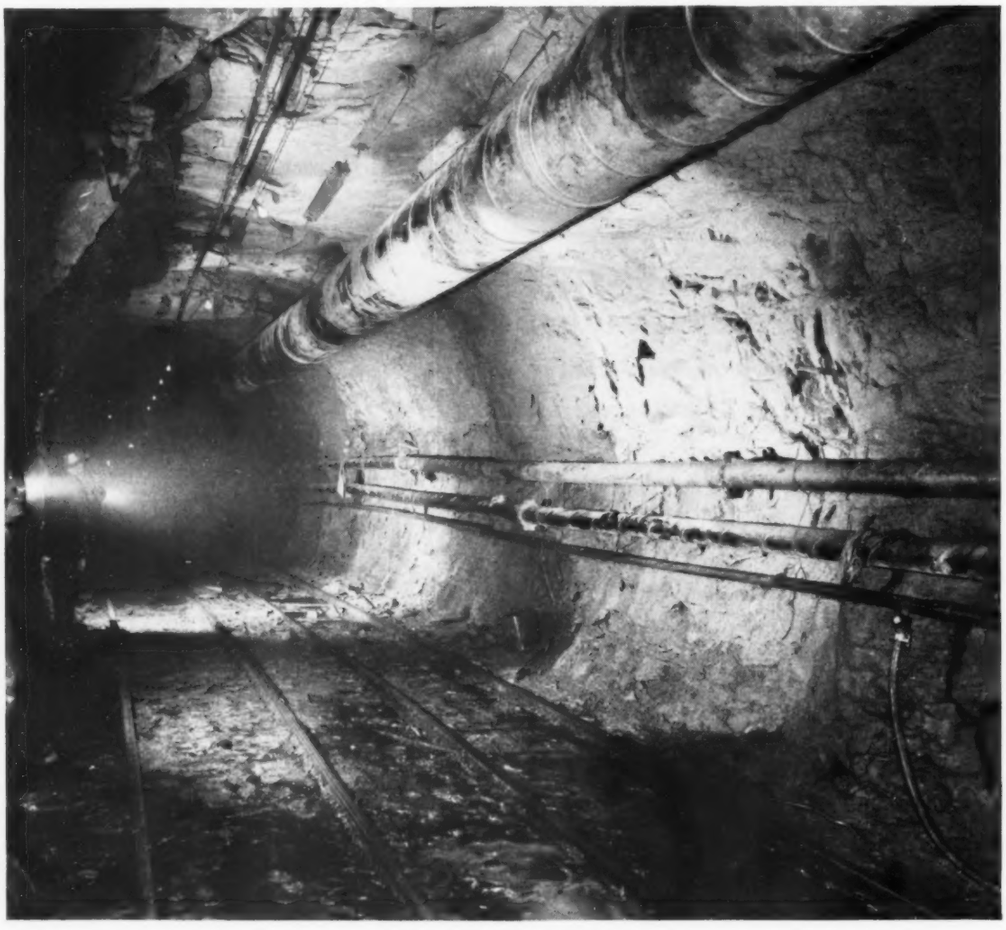
THE PROBLEM: *A public building contracting company placed an order with defendant for brick to be stacked on the site in advance of work. The order was accepted, but was silent as to when payment should be made. Defendant failed to complete delivery, claiming that the contracting company's foreman in charge of men and equipment on the job had agreed to an oral modification of the contract, under which the contract was to be terminable on the company's failing to pay for brick previously delivered by the tenth of each month. Was this agreement by the foreman binding upon the contractor?*

THE ANSWER: No. (Kelly Construction Co. v. Hackensack Brick Co., 103 Atl. 417, decided by the New Jersey Court of Errors and Appeals.)

The court said that the mere fact that the foreman had previously been permitted to buy trivial things in an emergency did not imply authority to modify a contract, made by the officials of the contracting company, to buy more than $5,000 worth of materials.

However, according to a decision by the New York Court of Appeals, a contractor's superintendent would be deemed to have authority to purchase stone for construction of a bridge, if previously the contractor had honored bills for cement purchased by him. (Beattie v. D. L. & W. R. Co., 90 N. Y. 643.) In that case defendant railroad was held liable on a purchase of stone made by its chief engineer under such circumstances.

A New Jersey case involved the liability of a principal for the price of pumps needed in the performance of a construction contract. It was decided that the fact that the agent had purchased other materials from



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Underground!

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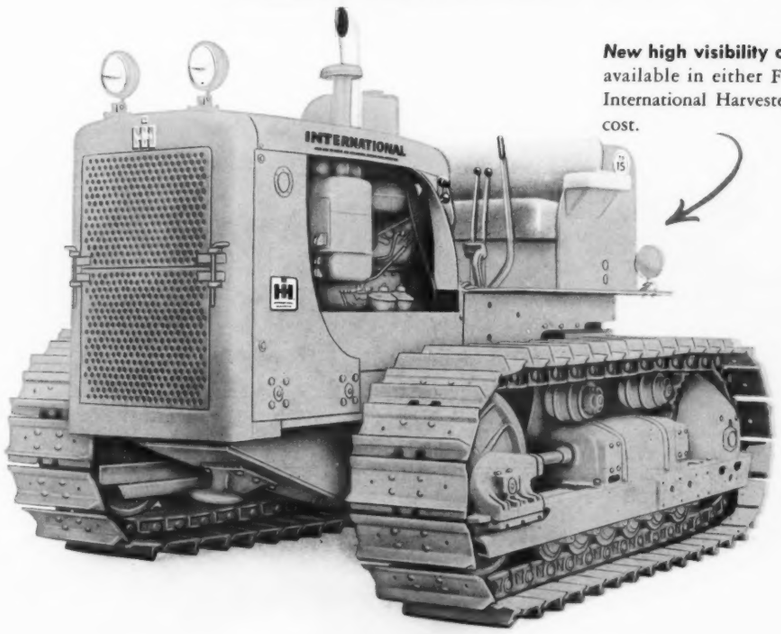
NEW International® TD-15 tops 100-hp field...

with exclusive power and control features!



***New* high visibility color.** Optionally available in either Federal yellow or International Harvester red at no extra cost.

NEW

6-cylinder diesel power . . . 105-hp fully-proven D-554 engine—full 20,500 lbs drawbar pull.

NEW

6-speed full-reverse transmission . . . 20% higher reverse speeds. A speed for every work or travel need plus fast "Shuttle-Bar" direction changing!

NEW

Precision control

Foot Decelerator for instant speed changes —fast "Shuttle-Bar" forward-reverse travel.

NEW

1,000-hour lube interval, heavy-duty track rollers

. . . heavy-duty, long-life bushing type, with extra capacity lube reservoir.

...and here's the pay-off for you...

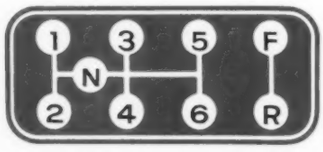
You move in on...and speed up

....with NEW TD-15

For "easing up" on power and speed without letting go of steering levers or other controls, simply use the optional "no hands" Foot Decelerator!

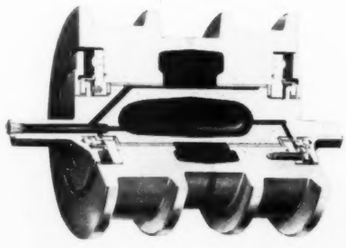
Exclusive six-speed "single stick" shift... forward and reverse "Shuttle-Bar"

You shift through all six speed ranges of the new TD-15—forward or reverse—with a single lever. Shift pattern is planned for gear-changing ease and speed with a fast sweep of the hand—to give you instant use of the speed you need. To speed the work-cycle and take full advantage of fast shifting, you simply push or pull the "Shuttle-Bar"—to change TD-15 forward or reverse instantly.



1,000-hour lube interval, heavy-duty, track rollers

Not just another "claim" . . . International now combines heavy-duty *bushing design*, exclusive cartridge-type *metal-to-metal seals*, and king-size lube reservoirs, to offer the industry the first heavy-duty type roller as standard equipment on the TD-15. Thick shells for safe build-up and exclusive pressure relief passages for flush-out and prevention of seal damage from power lubricators are part of this new design.



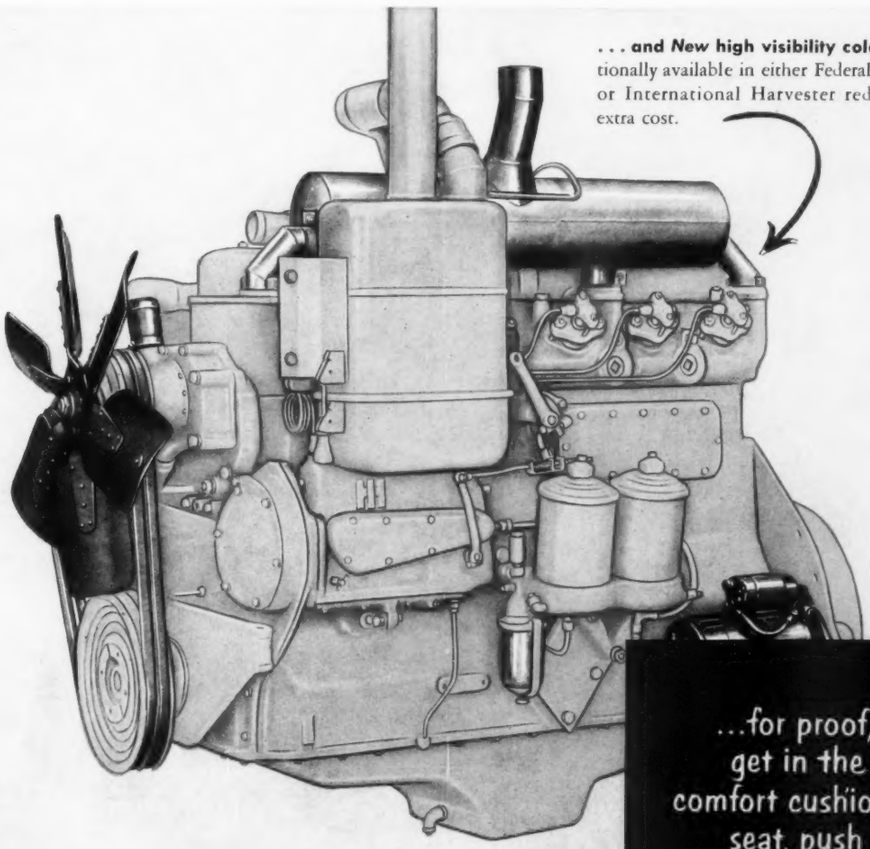
...a whole new range of jobs...

capacity and control

Smooth 6-cylinder... BIG 105 IH diesel horsepower

You get 6-cylinder smoothness from this new International D-554 diesel engine that powers the new TD-15. This fully-proven power plant produces its 105 net hp at 1,650 rpm . . . features famous International 45-degree angle operation full-flow lubrication, closed pressurized cooling, exclusive twin plunger pump fuel injection system, fully counterbalanced crankshaft, positive valve rotators, and all-weather gasoline conversion starting. Here's an engine built for long life, big-capacity output!

New power, strength, control, and reliability features like these show you how and why the 105-hp TD-15 tops its field. You move in on a new range of heavy jobs—material-moving, land-clearing, hauling, loading, excavating, logging, mining—that no longer belongs to next-size-bigger crawlers!



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Compare TD-15 performance to anything *in the 100 hp crawler field!*

Prove to yourself you can move in on, and speed up, a whole new range of heavy jobs—with new TD-15 capacity and control. Put the TD-15 through its paces—compare *power*, *speed*, *capacity*, and *control* to anything else on tracks in the 100 hp field. The 6-speed full-reverse transmission and "Shuttle-Bar" will show you on-the-job how fast, easy, and profitable shuttle-cycle operations can be! Press the decelerator and see what a helper this feature can be for actually speeding up operations—by reducing declutching and shifting time! Measure sintered metal, dry-type clutch full power transfer efficiency and maintenance, ease and economy to any other crawler's clutch—wet or dry! See your International Construction Equipment Distributor for a new TD-15 demonstration!

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other parties and the bills had been paid by the principal could be considered, along with other evidence, to show implied authority to make the particular purchase. (American Well Works v. Royal Indemnity Co., 160 Atl. 560.)

In Georgia, a building contractor was authorized by the owner to purchase on the latter's credit all materials necessary to complete the job according to plans and specifications. The Georgia Court of Appeals decided that the owner was liable for paint needed to complete the job, although the specifications did not cover it. (Greensboro Bonded Warehouse Co. v. Klein Mfg. Co., 134 S. E. 140.)

Contractor and lessor responsible for death

THE PROBLEM: *A contractor undertook to erect steel framework for a building and rented a crane, the lessor furnishing an operator. The boom was moved on signal from the contractor's employees. There was an uninsulated high-tension electric wire overhead, but the crane operator had kept the boom at least six feet away until almost all the steel beams had been hoisted into place. Then he negligently permitted the boom to contact the wire, and an employee of the contractor was electrocuted. The widow sued for damages and was awarded joint judgment against the contractor and the crane lessor. Was the latter entitled to have the judgment set aside?*

THE ANSWER: No. (O'Connell v. Roefaro, 137 Atl. 2d 325, decided by the Pennsylvania Supreme Court.)

The court said that the jury was warranted in finding that the crane operator had not become a temporary employee of the contractor.

Street-paving assessment

THE PROBLEM: *A statute required that owners of property to be assessed for street improvement be notified of a city council meeting to hear any objections, and that the notice specify the character of improvement to be constructed. It was not required that the notice specify the width or thickness of the pavement. A notice specified that two-thirds of the cost, based upon the cost of a 36-foot pavement, would be assessed against abutting property. The paving to be constructed, under a unit-price contract, was 42 feet wide and 8 inches thick. Did that invalidate the assessments?*

THE ANSWER: No. (Bell v. City of Shreveport, 100 So. 2d 883, decided by the Louisiana Supreme Court.)

Property owners unsuccessfully attacked the assessments, particularly on the ground that the notice implied that the improvement would conform to the usual construction width on residential streets—36 feet—and concealed the fact that the avenue was to be paved as a highway. The court also ruled that the statute did not require a "turnkey contract" but permitted award of a contract at unit prices.

Machine rental is labor

THE PROBLEM: *In Tennessee, state highway contractors must give bond for performance and for payment of labor and materials used. A subcontractor hired a drill machine, tractor cable controls, and a dozer at specified monthly rentals, plus taxes. The lessor also furnished parts and service for the equipment. After part performance, the subcontractor was unable to proceed for lack of funds, and the prime contractor took over. Under the latter's bond, was the surety liable for unpaid rentals owing by the subcontractor?*

THE ANSWER: Yes. (Thompson & Green Machinery Co. v. M. P. Smith Construction Co., 311 S. W. 2d 614, decided by the Tennessee Court of Appeals, Nashville.)

The court noted that this decision is in line with the rule adopted by the federal courts covering bonds to pay labor and material claims arising out of federal building and public-works contracts. But there is disagreement among the state courts as to the coverage of equipment rental charges by bonds to pay for labor and materials.

Owner breaks contract

THE PROBLEM: *A paving contractor claimed damages because he was permitted to install only six of 180 driveways covered by his contract. If it would have cost him less to perform the contract than the amount of the contract price, was he entitled to collect damages on the difference, even though he was busily employed on other profitable jobs?*

THE ANSWER: Yes. (Sides v. Contemporary Homes, Inc., 311 S. W. 2d 117, decided by the St. Louis Court of Appeals.)

The Missouri court noted that the rule of law that an employee cannot collect damages for breach of an employment contract, covering a period when he was employed elsewhere at the same or at better salary, does not apply to independent contractors. Of course, the distinction is justified by the fact that an employment contract requires the employee's personal services, while an independent contractor can engage a number of workmen for several contracts.

"G-E two-way radio lets me travel between jobs

and direct my men at the same time..."

says Milford Redman, Gen. Supt., Villa Contracting Company, Inc. of Westfield, N. J.

"When I'm approaching the job in the morning, I can start getting reports and issuing instructions even before I arrive," adds Mr. Redman. On its heavy excavating and road-building jobs, Villa uses General Electric two-way radio to keep things moving on schedule, get the most out of men and machines, and co-ordinate with suppliers such as transit-mix concrete.

Whether you're working on one job or twenty, General Electric two-way radio helps put the right equipment at the right spot at the right time—with minimum confusion and delay. No piece of mobile equipment or work crew is ever farther away than the G-E microphone in your car or on your desk.

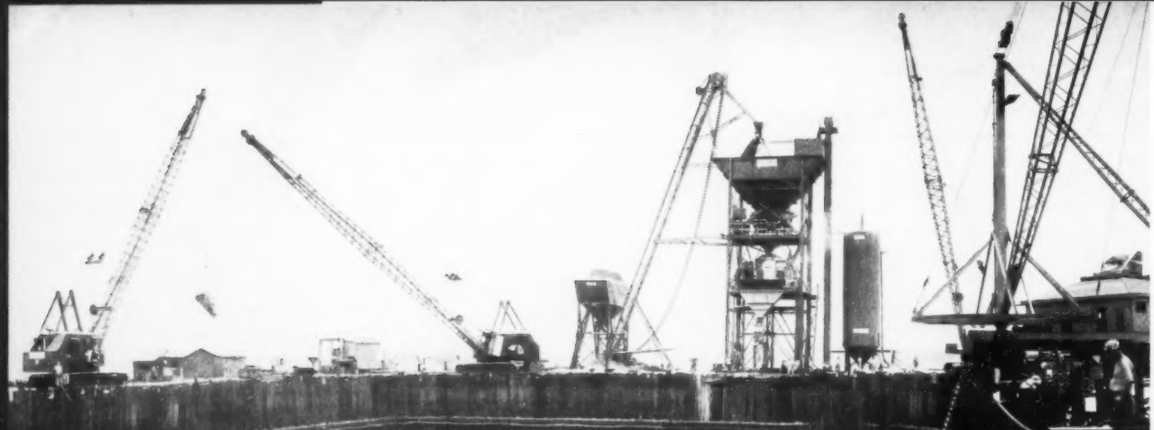
General Electric's Progress Line is built to take plenty of punishment . . . with transistorized power supplies . . . pre-tested tubes to withstand shock and vibration . . . interchangeable plug-in chassis for faster servicing. Authorized G-E service is available everywhere in the U. S.

Find out how General Electric two-way radio can increase your profits on every job. Call a G-E communications consultant, listed under "Radio Communication Equipment" in the Yellow Pages. Or write to General Electric Company, Communications Products Dept., Section 30128, Lynchburg, Va.

GENERAL ELECTRIC

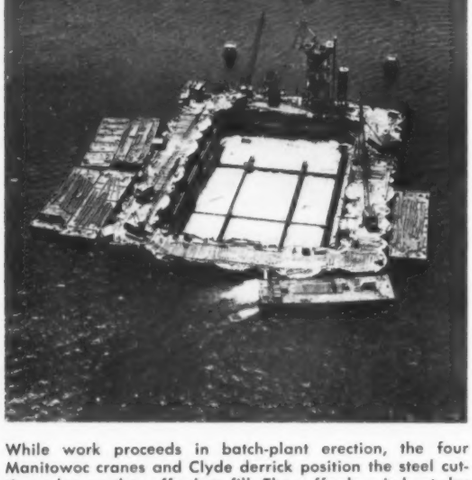
Communications Products Department, Lynchburg, Virginia

For more facts, use Request Card at page 18 and circle No. 231



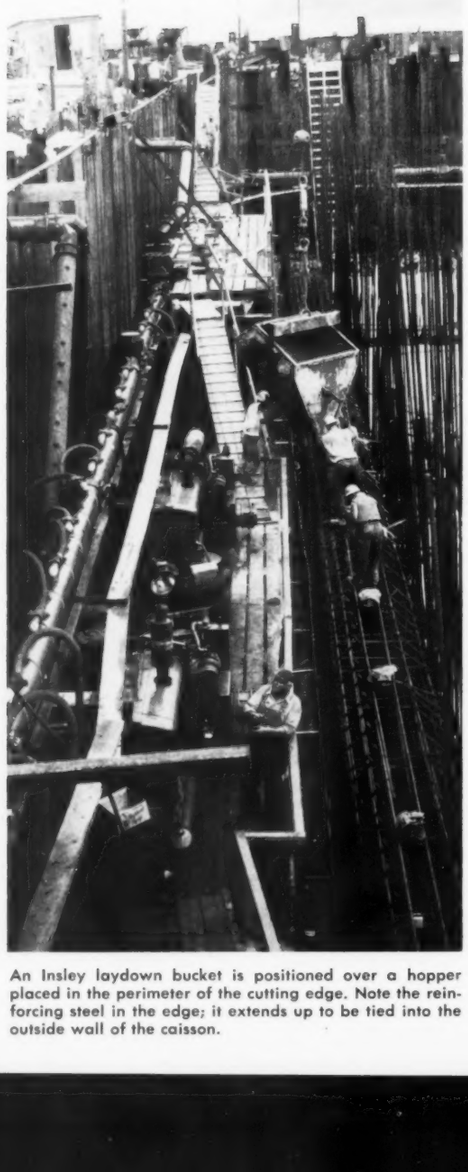
A start is made on the new Throgs Neck Bridge between Queens and the Bronx in New York City as the caisson is formed for the Queens anchorage. Manitowoc 3900 cranes and a Clyde derrick use Insley 1½-yard buckets in placing the concrete. Universal plywood forms for the transition lift above the steel cutting edge are being placed by crews. Excavation of fill will be done through digging wells to be formed above the square openings as the caisson is being sunk.

Planning helps to hurdle problems on anchorage job



While work proceeds in batch-plant erection, the four Manitowoc cranes and Clyde derrick position the steel cutting edge on the cofferdam fill. The cofferdam is kept dry by a two-stage wellpoint system.

The Clyde derrick with 150-foot boom swings a bucket to the cutting edge of the caisson surrounding the cofferdam fill. Note the glass bubble on the derrick house. It gives the operator good visibility and protection against the weather.



An Insley laydown bucket is positioned over a hopper placed in the perimeter of the cutting edge. Note the reinforcing steel in the edge; it extends up to be tied into the outside wall of the caisson.

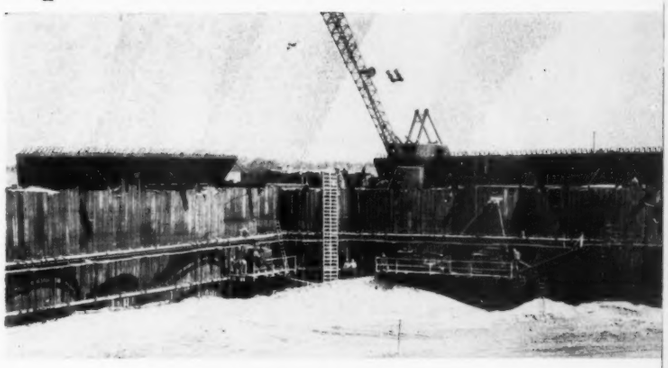
Preparations for sinking the caisson for the difficult Queens anchorage of the Throgs Neck Bridge in New York City included leveling off the river bottom, building a cofferdam, hauling in fill, installing a complex dewatering system, and setting up a high-output concrete batch plant. All of this work required a tremendous amount of planning to allow the joint-venture contractor to work completely in the dry within the 260×170-foot cofferdam area.

The joint venture consists of J. Rich Steers, Inc., and Frederick Snare Corp., both of New York City, with Steers as the sponsoring company. The Bronx anchorage is being built by Felhaber Corp., also of New York City, under a separate $7,200,000 contract, and while the caisson operations of the two contracts are generally similar, the over-all Steers-Snare job gets first prize for the num-

Concrete from the wet-batch hopper pou through a 3-way chute to an Insley bucket. Th chute can be electrically positioned to eith side or to the front to fill buckets.

Rigs and material on this job

Four Manitowoc 3900 cranes
McKiernan-Terry 10-B-3 hammers
Bethlehem SP6A sheet piles rented from L. B. Foster Co.
Two Griffin Wellpoint systems
Cat D4 tractor-dozer
Clyde derrick
Universal plywood forms
Sisalkraft paper
Blaw-Knox steel forms
Erie Strayer batch plant
Universal bucket elevator
Two Worthington 84-S mixers of 3-yard capacity
Type II portland cement
Fuller-Kinyon air pump
Two Gar-Bro 3-yard buckets
Four Insley 1½-yard laydown buckets
Master Builders air-entraining agent



One of the last jobs before the cutting edge was assembled was the installation of the second-stage Griffin Wellpoint system. Dewatering pumps dropped the water level to minus 8 feet so that the first system could be installed and bring the level to minus 17 feet. The second-stage header keeps the level at minus 25 feet.

(Additional photo on front cover)

ber of big headaches involved.

Riverbed leveled

Before any fill was placed to level the riverbed so that a cofferdam could be driven, the entire anchorage area was dredged to remove the existing mud and silt. Over 14,000 yards of material had to be removed before Steers-Snare began operations on the $10,600,000 contract in March by hauling in about 148,000 cubic yards of fill for the anchorage location. The fill was delivered to the river site by bottom-dump barges and placed to level the riverbed, which sloped from minus 25 feet inshore to minus 65 feet on the river side. The underwater fill formed a platform with a uniform elevation of about minus 30 feet. A rock fill was needed to retain the sand fill at the deep points and to prevent slides.

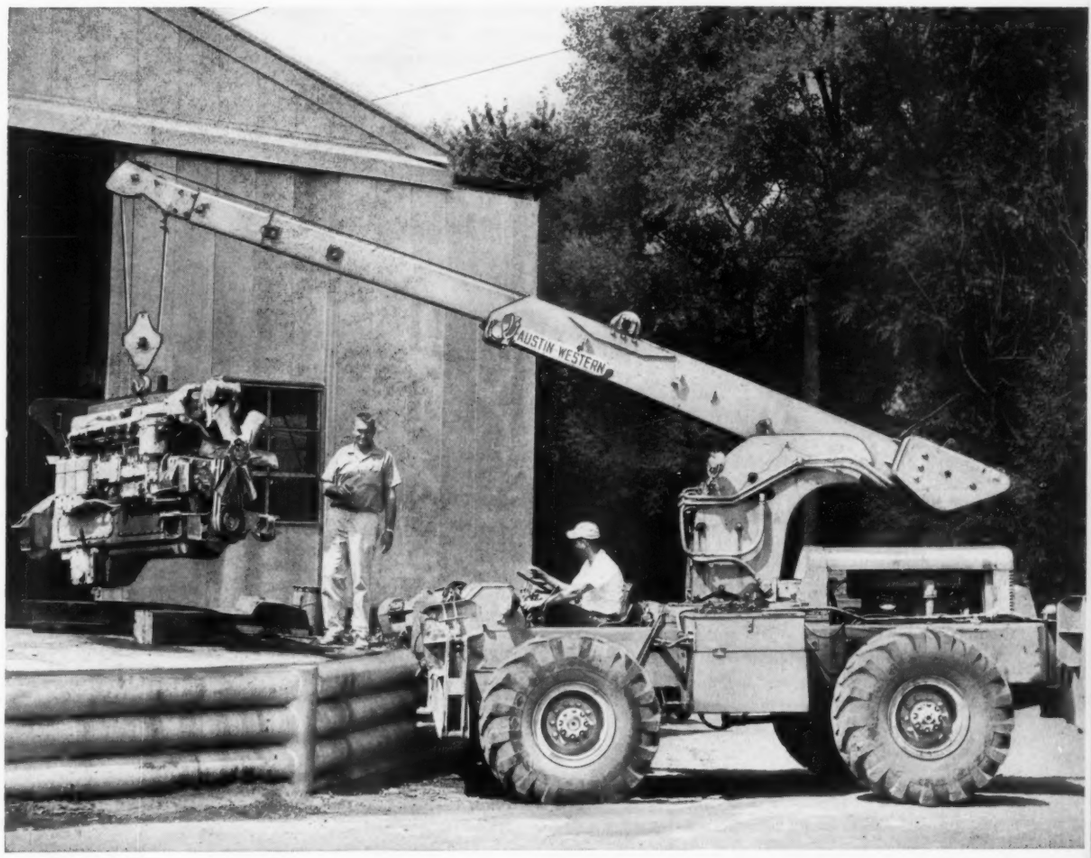
This entire phase of work was necessary to provide a suitable area through which a cofferdam could be driven. The first two of the eighteen 50-foot-diameter cofferdam cells were driven with a barge-mounted crane. The cells are 55 feet on centers and have exterior and interior 35-foot closure walls. After the first two cells were driven and connected, the barge-mounted crane filled them with sand delivered by the bottom-dump barges.

Two cranes with hammers were then positioned to complete the cofferdam. The cranes worked in opposite directions while driving the 47-foot-long sheet piles making up the cells and closure walls. A few cells of the 260×170-foot cofferdam area were left open so that bottom-dump barges could haul fill into the cofferdam and build up the fill elevation to minus 20 feet. Once this was done, the remaining cells were driven to completely enclose the area.

Install wellpoints

The cofferdam was dewatered by

(Continued on next page)



Austin-Western Hydraulic Crane is Ohio contractor's key materials handling unit

C. F. Replogle Co. serves the tri-state area of Ohio, West Virginia and Indiana as engineer and contractor, did close to a $10 million business in 1957. During the 1954 season, the company rented an A-W crane to assist in maintaining its $¾ million worth of equipment at its five central shops, in Circleville, Ohio. The crane soon proved itself invaluable, and Replogle decided to buy it. In addition to doing the heavy lifting on maintenance jobs, the crane serves the yard detail in handling cables, rollers, oil and other material.

The company tells us: "Everything in the maintenance yard and shops revolves around and depends on the use of this A-W crane. The shop foremen hate to see the crane rented out occasionally, as a favor to neighboring plants, because it requires a bit of planning to avoid interruptions of work, even for the small average of 3 hours a week that it can be spared. In summer it works nearly 16 hours per day. In winter it works about 8 hours per day.

"This unit has unlimited flexibility and turns from handling large crane boom sections in the yard to loading spools of wire on trucks, then to lifting an engine out of a machine. The precise hydraulic control saves time and avoids damage to valuable equipment during repairs."

For the complete C. F. Replogle story, write for Certified Gould Report No. 5705.

Austin-Western CONSTRUCTION EQUIPMENT DIVISION, AURORA, ILL.

BALDWIN · LIMA · HAMILTON

Power graders • Motor sweepers • Road rollers • Hydraulic cranes

For more facts, use Request Card at page 18 and circle No. 232

(*Continued from preceding page*)

three pumps, which dropped the water level to about minus 8 feet. At this level, the first of two wellpoint systems was installed. This first stage, consisting of a 10-inch-diameter header running completely around the cofferdam area at elevation minus 5 feet, was installed to draw the water level down to minus 17 feet. The second stage 12-inch-diameter header was installed at elevation minus 15 feet to draw the water level down to minus 25 feet.

With the 2-stage wellpoint system maintaining the water level at minus 25 feet, Steers-Snare could excavate the fill to the desired elevation of minus 21 feet. A small tractor-dozer was lowered into the cofferdam to assist cranes excavating with 3-yard clamshell buckets.

Before the assembly of the caisson cutting edge was started on the fill, Steers-Snare placed two more cranes on the cofferdam cells, bringing the total to four, and erected the stiffleg derrick which will handle most of the concrete placing. In order to position the derrick at the most efficient location on the cofferdam cells, the contractor had to do a lot of figuring. The derrick has a 150-foot-long boom with a capacity of 12 tons in flat-boom position and 19 tons in high-boom position. It is powered by a 200-hp 3-drum hoist and a 50-hp swinging engine.

The exact position of the derrick had to be related to the position of the batch plant, since the derrick will place concrete as well as handle caisson excavation. In this case, the batch plant was spotted at the center of the short, inshore cofferdam wall. Earl Larson, the project manager for Steers-Snare, had to make more than eleven different determinations to fix the exact location and size of the derrick, taking into account the positions of the four cranes and the placing of forms and reinforcing. Another important consideration that had to be included was the average mean time for complete swing cycles between pickup points. This had to be done to determine the most economical and the fastest cycle with the least number of boom changes.

Taking all these items into consideration, the contractor chose the position which has the derrick in high-boom position when making a pickup at the concrete batch plant. This positioned the derrick on one of the long cofferdam walls and resulted in a straight-line distance of 138 feet between the batch plant and derrick.

The high-boom position was chosen because it would permit concrete pickup and dumping to be done without any boom changes within a 138-foot radius. Any distances beyond this radius, and up to 150 feet, require a flat boom. This means that the derrick operator would have to lower the boom from the high-boom position at the batch plant pickup to a flat-boom position at the dump. But dropping the boom is more efficient, since it can be done faster than trying to boom up all the time. This would have been necessary if the derrick had been positioned 150 feet—or the flat-boom reach—away from the batch plant.

From its position, the derrick is capable of reaching about four-fifths of the 77 digging wells of the caisson. The four cranes are also strategically spotted on the cofferdam to handle the caisson areas inaccessible to the derrick.

Cutting edge assembled

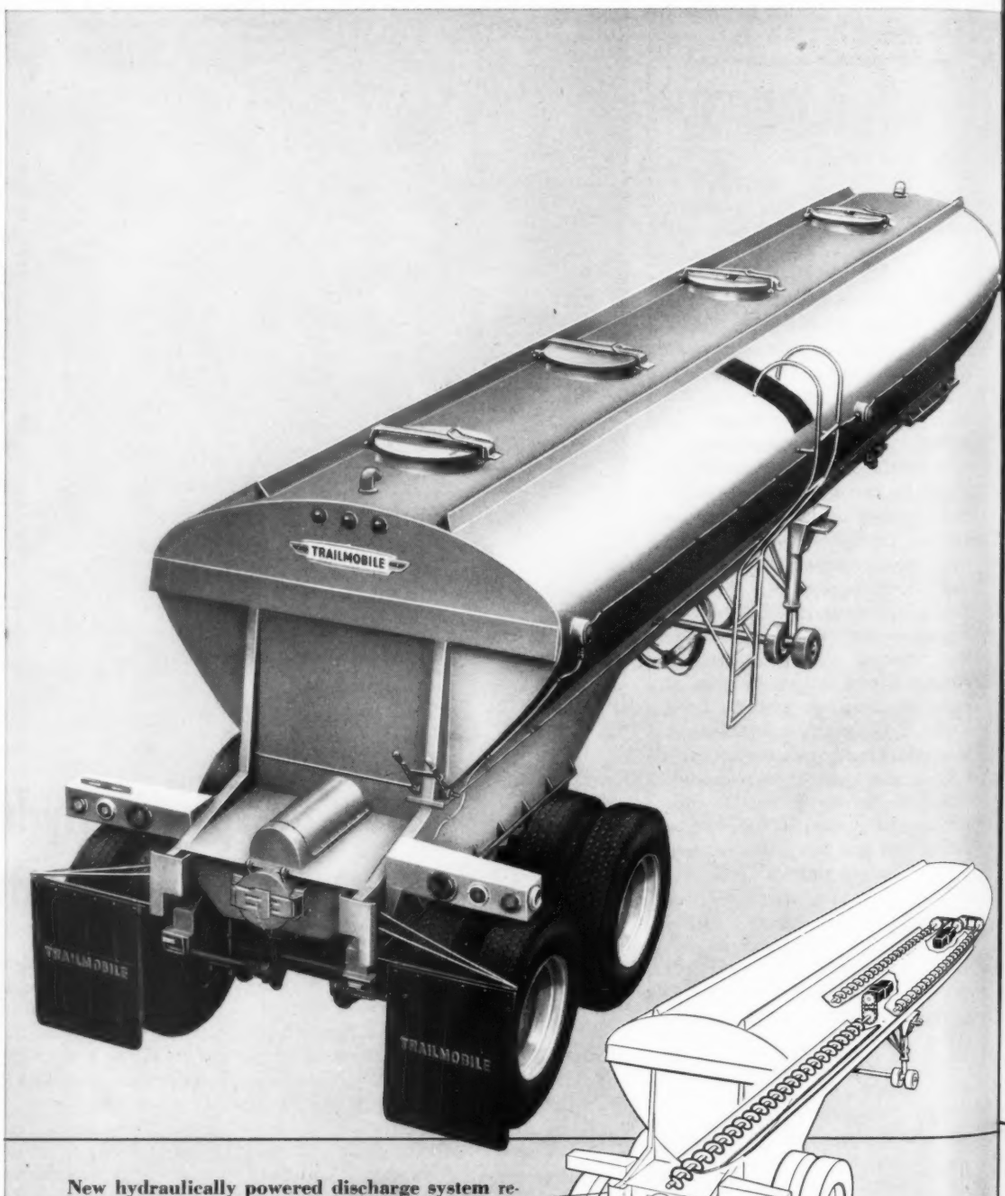
Elizabeth Iron Works, Union, N. J., fabricated the steel cutting-edge sections, which were trucked to the contractor's onshore yard. The sections were loaded on barges and hauled out to the river site, then lowered onto the dry fill inside the cofferdam by two cranes. The 7-foot-deep sections were welded together and braced with two longitudinal and two transverse box girders to form the 146 × 226-foot cutting edge.

Once the sections were assembled, a 7-foot lift of sand was placed inside the cutting edge. This formed a level surface across the top of the cutting edge to support the concrete-slab and digging-well forms of the caisson. The fill was placed by a crane with a 3-yard clamshell bucket.

Steers-Snare placed 6-foot-high 16-foot-square plywood forms on the cutting edge fill to begin the forming of the 77 digging wells of the concrete caisson. These 6-foot-high square forms acted as the transition between the flat concrete slab over the cutting edge and the 16-foot circular wells.

Sisalkraft paper was laid over the sand fill and between the 16-foot-square forms to prevent any disturbance of the fill as concrete was placed. During form erection, the four cranes and derrick were used to place the heavy reinforcing in the cutting-edge steel, the longitudinal and transverse bracing, and reinforcing steel between the forms.

Before concrete placing started, cantilevered forms were erected along the outside perimeter of the cutting edge. This was necessary to start forming the vertical face of the caisson, as well as to retain the concrete being placed on the fill. What this operation actually produced was a 6-foot-thick concrete cap, over the steel cutting edge, which has seventy-seven 16-foot-square openings



New hydraulically powered discharge system retains famous Trailmobile 2-stage conveyor but utilizes 3 screws as shown at right. *Two* hydraulic motors—independently controlled—are located at the drive sprocket of the screws to eliminate the necessity of clutches, counter balances and gear reduction systems. Reversing direction of the screws permits added assurance of getting stubborn loads unloaded as well as discharge at center when center opening is provided.

between the longitudinal and transverse bracing.

Caisson wells

From this 6-foot lift, Steers-Snare began using circular steel forms for the 16-foot-diameter digging wells over the square openings. These collapsible forms make it possible to place concrete in 5-foot lifts. About 1,200 tons of concrete is required to form each 1-foot height of the caisson.

Before the contractor began excavating the fill through the digging wells, four 5-foot lifts were poured, bringing the total height of the caisson to 33 feet. This includes the 7-foot steel cutting edge and the 6-foot transition lift.

Excavation of the fill was then started by the four cranes and the derrick, causing the caisson to sink into the fill. Once the bottom of the cutting edge reached elevation minus 45 feet, excavation was suspended. Since the top of the caisson was at elevation minus 12 feet, the contractor was free to remove the bottom second-stage wellpoint system, allowing the water level to return to minus 17 feet. The top first-stage system will maintain this water level for the duration of the project, or until the caisson reaches its founding depth of minus 135 feet.

Steers-Snare plans to pour and sink the caisson in approximately 30-foot stages, pouring the concrete lifts for one-third of the caisson area at a time. The thirds are being poured consecutively: first the south, then the middle, and then the north third. The pours are cured with water and the forms stripped after 12 hours. Four days must elapse before the next lift is poured.

As men work on the forms, concrete is placed in the steel cutting edge. Sisalkraft paper atop the fill prevents falling concrete from disturbing the material underneath.

Concrete batch plant

The batch plant, located on the cofferdam, produces concrete at a rate of 150 cubic yards per hour. The plant consists of a 100-yard loading hopper, a bucket elevator to transfer aggregates to the plant's 200-yard aggregate bin, and two mixers of 3-yard capacity.

Charging of the 3-compartment loading hopper from the material barges moored alongside the cofferdam is being handled by one of the cranes equipped with a 100-foot boom. This hopper feeds sand, ¾-inch gravel, and ¾-inch stone to the inclined bucket elevator, which transfers the material to the plant bin through a 3-way chute. Electric controls, handled by the plant operator, power the loading hopper, elevator, and the 3-way chute. The plant bin also has an enclosed 400-barrel cement compartment for cement storage.

Type II portland cement is delivered to the plant in enclosed barges and transferred to the 1,140-barrel cement silo by an air pump. Cement can also be pumped directly to the bin compartment, completely bypassing the silo. This adds flexibility to the plant procedure and makes for a safer operation. Cement is generally transferred to the bin compartment by means of an enclosed bucket elevator, but should anything cause the elevator to shut down, cement can be fed directly to the compartment by the air pump.

A push-button control panel permits automatic operation of the plant. One button causes the aggregate, cement, and water to flow into the weigh batchers. This phase is automatically stopped as soon as the proper weights of materials are in the batchers. A second button controls the flow from the weigh batchers to one of the two mixers, while a third button discharges the mixers.

After the mixing cycle is completed, the mix is discharged into an elevated 6-yard hopper, which feeds an electrically operated movable

New Cement Tank Trailer

NEW shape . . . NEW low weight . . . NEW hydraulic discharge system

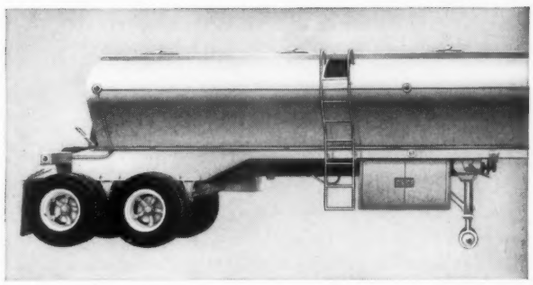
The many innovations offered in this new Trailmobile promise unprecedented advantages to operators.

Its unusually light weight provides for maximum payloads. Its simplified unloading mechanism permits precise control of screw speeds. Its overall design promises a substantial savings in maintenance.

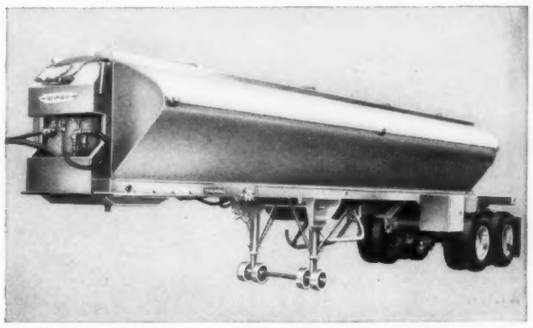
This is a lighter trailer because its vessel has a radically different shape which allows it to support as well as contain the load. It is a more versatile trailer because discharge can be accomplished over a wide range of speeds either at the rear or center of the unit—or both—according to your specifications. And it's a more dependable trailer because of a uniquely simple, close-coupled hydraulically powered discharge mechanism.

Further, you can have all these advantages in either of *two* types. One utilizes power take-off from the tractor, while the other—a self-contained unit—mounts a gas engine-driven hydraulic pump.

These are only a few of the benefits offered you in this new concept of cement tank trailer design. For the complete story contact your nearest Trailmobile representative or use the coupon.



Self contained unit has gas engine driven pump to energize hydraulic motors. Engine is housed in cabinet at center of unit.



Continuous contour shape plus reinforcing baffles and tension members cut weight without sacrifice of strength. Note the smooth clean lines of this fine trailer.

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Another preparatory job: erection of the Erie Strayer batch plant. A Manitowoc crane handles the Universal bucket elevator stand between the Erie loading hopper and the batch plant.

Material barges supplying aggregate and cement to the plant moor at the site of the anchorage. The plant itself is located on the cofferdam enclosing the 260 × 170-foot working area.

chute. The plant operator can move this chute to the front or to either side to fill concrete buckets for the cranes or derrick.

Water is supplied to the plant through a 3,000-foot-long submerged 4-inch line connected to a 12-inch main on shore. Electrical power, at 4,200 volts, is furnished by a submerged cable from shore. This power is fed to a transformer bank, located on the cofferdam cells, which reduces the voltage to 440 volts for the stiffleg derrick and batch plant, and to 110 volts for the lighting circuits used during the night.

A 6-bag mix is made up of 1,177 pounds of sand, 1,112 pounds of ¾-inch gravel, 963 pounds of ¾-inch stone, and 28 gallons of water. The contractor is using an admixture to maintain about 4 per cent air in the mix as well as to reduce the water-cement ratio. An average 3-inch slump is maintained.

Steers-Snare has to have the anchorage ready for cable spinning by September, even though the contract completion date is in December, 1960. When the anchorage is completed, it will rise 155 feet above the water.

Personnel

The Steers personnel on the project includes Earl Larson, project manager, and Frank McGahan, project engineer. The job is under the direction of John Malcolm, general superintendent, and Eugene Rau, vice president and chief engineer.

Amman & Whitney, New York City, the consulting engineering firm for the Triboro Bridge and Tunnel Authority, has William Delahanty as resident engineer for the entire project and Stanley Johnson as project engineer on the Steers-Snare job.

THE END

(A companion article appears on page 42.)

General Tire appoints

Don A. Ramier has been named manager of passenger-tire sales for the Houston, Texas, division of The General Tire & Rubber Co., Akron, Ohio. He was previously with the firm's Memphis, Tenn., division.

Tips on grade and alignment of Beth-Cu-Loy culvert pipe

BETHLEHEM STEEL

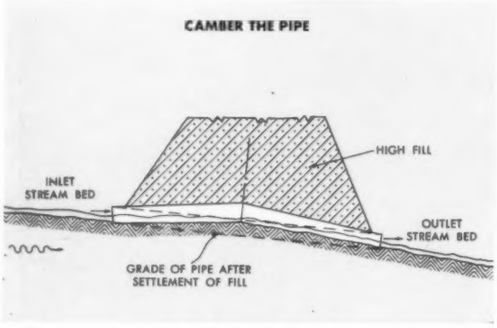
Because of its light weight and resistance to fracture, a culvert pipe made of Beth-Cu-Loy corrugated galvanized sheets is the easiest to install quickly and economically.

However, even with a Beth-Cu-Loy culvert, it pays to plan ahead for best results. Careless installation can undo a good design.

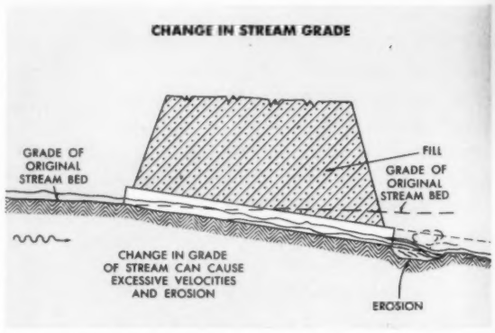
After making a careful study of the area and location, it's best to prepare a detailed plan to show all requirements. Width of highway, shoulders, slope of embankments, height of fill, grade of stream bed, elevation of culvert grade, length of pipe, skew angle, and other factors should be included.

The drawings shown here illustrate several typical culvert installations and grades under fill, with helpful comments covering the essentials in each example. Your own experience could no doubt embellish these cases to a considerable extent.

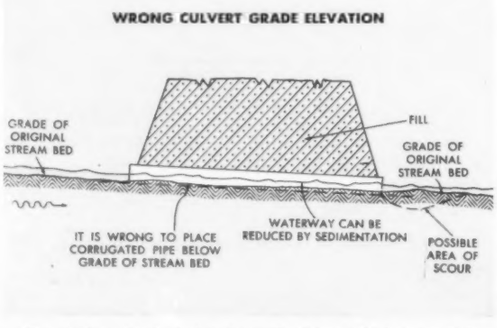
When you specify or order culvert pipe, be sure it is corrugated galvanized steel. Bethlehem does not fabricate this pipe as such, but we do manufacture the galvanized Beth-Cu-Loy sheets which fabricators make into pipe. In all respects Beth-Cu-Loy meets the rigid specs of the AASHO. For further information, write your fabricator for our Booklet 425-A, "Solving Drainage Problems."



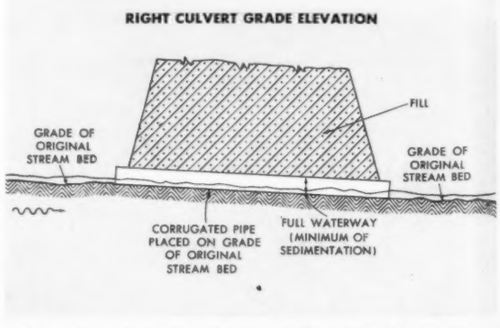
The corrugated steel pipe should always be cambered under a deep fill, so the grade of the pipe will level out with the settlement of the fill.


CHANGE IN STREAM GRADE
GRADE OF ORIGINAL STREAM BED
FILL
GRADE OF ORIGINAL STREAM BED
CHANGE IN GRADE OF STREAM CAN CAUSE EXCESSIVE VELOCITIES AND EROSION
EROSION

When the grade is increased in a stream bed and there is danger of excessive erosion at the outlet, the pipe should be continued to the point of disposal.


WRONG CULVERT GRADE ELEVATION
GRADE OF ORIGINAL STREAM BED
FILL
GRADE OF ORIGINAL STREAM BED
IT IS WRONG TO PLACE CORRUGATED PIPE BELOW GRADE OF STREAM BED
WATERWAY CAN BE REDUCED BY SEDIMENTATION
POSSIBLE AREA OF SCOUR

Do not place the pipe below the grade of the original stream bed. When this is done, there are hazards of sedimentation and serious scour at the exit.


RIGHT CULVERT GRADE ELEVATION
GRADE OF ORIGINAL STREAM BED
FILL
GRADE OF ORIGINAL STREAM BED
CORRUGATED PIPE PLACED ON GRADE OF ORIGINAL STREAM BED
FULL WATERWAY (MINIMUM OF SEDIMENTATION)

Place the culvert pipe on the same grade as the original stream bed, and without change in the natural slope of the stream, if possible.

Labor review

Strikeless negotiations strongly urged by contractor spokesman

The construction industry has reached the point where work stoppages no longer are the "logical or practical" answer to collective-bargaining disputes, according to Paul J. Brienza, managing director of the Building Contractors Association of New Jersey.

Brienza, addressing a meeting of the Construction Contractors Council of Washington, D. C., strongly urged building trades unions to discard the strike weapon, and he suggested that in its place arbitration procedures be substituted. "Collective bargaining has reached a stage of maturity in this country where the unions need not resort to such outmoded tactics", the employer representative asserted.

Turning briefly to the subject of unjustified labor costs, Brienza advised the Washington contractor group to begin thinking about next spring's negotiations. He suggested that they start talking now with union officers and business agents, "urging them to re-evaluate the recent unrealistic trends of exorbitant demands". He went on to say that "management must be firm in resisting these reckless demands . . . if it wants to continue attracting investors and owners to build".

Latest boilermaker pact gives mechanics $3.60 in southeastern states

Boilermakers wrapped up their 1958 negotiations with the signing of their fifth area agreement. This agreement, following the 15-cent pattern established in other areas, covers the southeastern states of North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi, and Florida.

The 15-cent hourly wage increase brings the rate for mechanics to $3.60, according to union reports. Other contract changes reportedly cover employer contributions to the jointly administered health-welfare plan and apprentice training program.

A separate agreement negotiated with construction employers in Kentucky raises the hourly wage rate 12½ cents to $3.62½.

Wasteful work practices condemned in statement by Cleveland union official

Cost-conscious contractors got an assist from Thomas E. McDonald, business manager of the Cleveland Building and Construction Trades Council, in the form of a statement blasting wasteful work practices and pointing up labor's responsibility to management and to the public.

McDonald, writing for the Council's yearbook, made mention of the 10-point productivity code endorsed early this year by the AFL-CIO Building and Construction Trades Department, and then turned to the local version worked out between the Building Trades Council and the Building Trades Employers Association of Cleveland.

The productivity understanding, he explains, was reached in negotiations this spring and is part of a 3-year agreement.

Among other things, it provides for an 8-hour workday with no coffee breaks and a half-hour lunch period.

Report injury rates in contract construction dip to record low

Injury rates in contract construction set a new record low in 1957, according to the Labor Department's Bureau of Labor Statistics.

The average injury-frequency rate for all types of contract construction declined from 31.2 injuries per million hours worked in 1956 to the new low of 30.3.

However, the cases reported in 1957 tended to be slightly more serious than those reported in 1956, with the average days of disability increased from 85 per case in 1956 to 95 in 1957. There were slightly higher proportions of deaths and permanent impairments in 1957.

The steady decline in injury rates from the 1950 peak year reflects increased safety activity in the industry, while the increased seriousness is due to some minor disasters, according to the report.

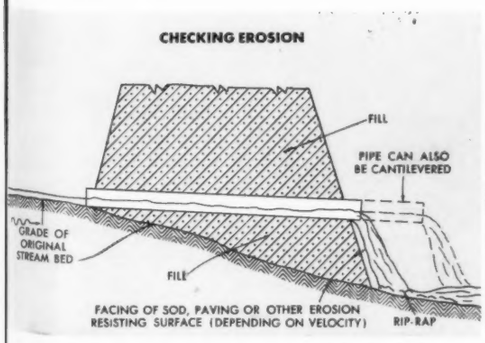
Millwrights, pile drivers in Houston area okay 36½-cent package

Houston millwrights and pile drivers went along with the 36½-cents-per-hour wage package previously okayed by Houston carpenters.

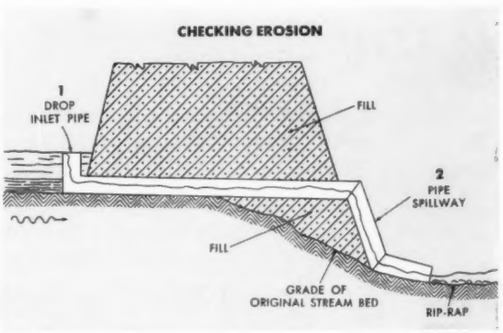
The first 18½ cents was effective immediately, with the remaining 18 cents to be added to wages on July 1, 1959. The initial increase brings the rate for journeyman pile drivers to $3.26 an hour, while journeyman millwrights get $3.41. The agreements expire July 1, 1960.

The millwright agreement also requires contractors with more than five millwrights on the payroll to "employ one millwright not less than fifty years of age".

Installing a 48-in. asphalt-coated Beth-Cu-Loy culvert under a U. S. highway bypass near Harrisonburg, Va. Note grade of culvert and the precautions taken to assure correct alignment.



Two methods of checking erosion at the exit bank are shown here. The best and most economical solution is to extend the corrugated steel pipe as a cantilever.



Two practical methods of checking soil erosion by the use of (1) a corrugated drop-inlet pipe at the entrance, and (2) a corrugated pipe spillway at the exit.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

For more facts, use Request Card at page 18 and circle No. 234

Names in the news

Armstrong and Bonny honored by The Moles

James F. Armstrong and John Bruce Bonny have been named the 1959 recipients of The Moles' annual awards for outstanding achievement in construction. Formal presentation will be made at the annual Moles' Awards dinner at the Waldorf-Astoria Hotel, New York City, on January 28. The awards will be given to one member, Armstrong, and to one non-member, Bonny.

Armstrong is vice president of the Peter F. Connolly Co., New York City. He has been in the heavy-construction field for over 50 years. Much of his work has been with pneumatic caissons for bridge foundations.

Bonny is vice president and general manager of Morrison-Knudsen Co., Inc., Boise, Idaho.

James F. Armstrong, left, and John Bruce Bonny, the 1959 recipients of The Moles' annual award.

Intrusion-Prepakt news

Roscoe C. Jennings has been promoted to assistant chief engineer of Intrusion-Prepakt, Inc., Cleveland, Ohio. Jennings joined the firm two years ago as an engineer. The company specializes in the construction and maintenance of heavy concrete structures and foundations.

Ebasco names Fairbanks consulting civil engineer

H. K. Fairbanks has been appointed consulting civil engineer by Ebasco Services Inc., New York City. At the same time, H. W. Stuber has been made chief concrete-hydraulic design engineer, and A. T. Larned associate consultant in the consulting engineer division of the firm.

Fairbanks was formerly project engineer on a large number of hydroelectric and thermal electric generating stations.

A member of the firm for 36 years, Stuber has been project engineer on many hydroelectric projects both here and abroad. Larned, a 46-year member of the company, has been consulting civil engineer since 1955.

For more facts on Insert, circle No. 236→

H. K. Fairbanks, consulting civil engineer for Ebasco Services Inc.

H. Buckley Dietrich, recently elected president of the American Institute of Steel Construction.

H. B. Dietrich elected new president of AISC

The American Institute of Steel Construction has elected H. Buckley Dietrich president. The national association of the structural steel fabricating industry also elected James M. Straub first vice president; Harold G. Lewis second vice president; M. Harvey Smedley secretary; and Erwin P. Stupp treasurer. L. Abbett Post, who has been executive vice president since 1947, was re-elected to that office.

Six new directors were elected and seven re-elected.

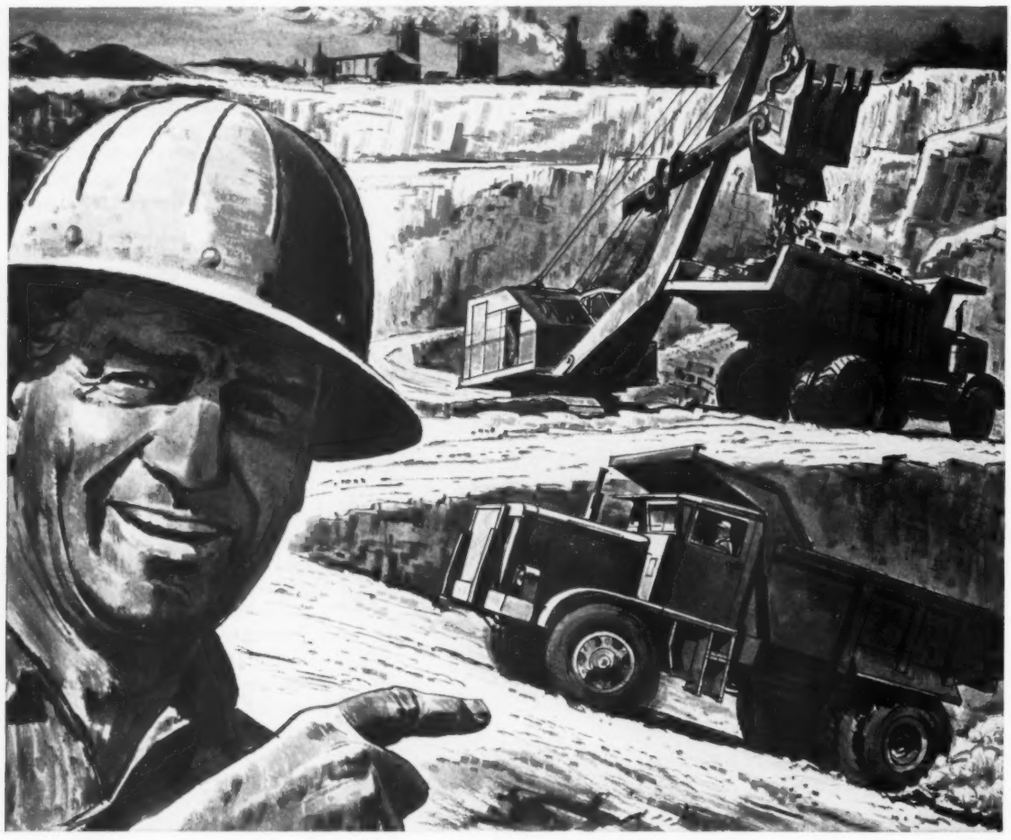
NCA has general counsel

John K. Carroll has been appointed by the National Constructors Association to the newly created post of general counsel. Carroll, who is a member of the New York City law firm of Davies, Hardy & Schenck, has been serving the association for the past nine years before administrative agencies, in the federal courts, and in legislative and labor matters.

The new NCA executive committee consists of E. J. Ford, C. D. Haxby, Thomas W. Hopper, D. S. Pelletier, Paul L. Wetcher, and W. R. Wood. Richard Chislett is executive secretary.

ARBA names PR director

T. Randolph Russell is the new director of public relations for the American Road Builders' Association, succeeding the late Robert L. Smith. Russell was formerly press and research assistant to Sen. Strom Thurmond (D., S. C.), and prior to that appointment was a newspaperman in Augusta, Ga.



"Nothing speeds up round trips like TORQMATIC DRIVE"

Check with a job superintendent when he's checking his contract's timetable and he'll show you the big difference TORQMATIC DRIVES make on a job.

He'll show you, for instance, that trucks equipped with TORQMATIC DRIVE move 50%, 100% or even more payload per shift than stick-shift trucks.

He'll tell you that TORQMATIC's uninterrupted power flow means faster going upgrade . . . that its built-in hydraulic retarder means safer going downgrade . . . that it helps trucks wade through hub-deep mire or grasping sand that bring regular trucks to a crawl or a stall.

And when he gets down to maintenance and repairs, he'll show you really sensational equipment availability records.

It all adds up to faster contract completion, bigger profits per contract . . . the kind of records and cash you'd like to ring up.

If you're thinking about buying equipment, think about getting it with TORQMATIC DRIVE. It's available in almost any type of construction equipment you can name—or use. See your equipment dealer or write:

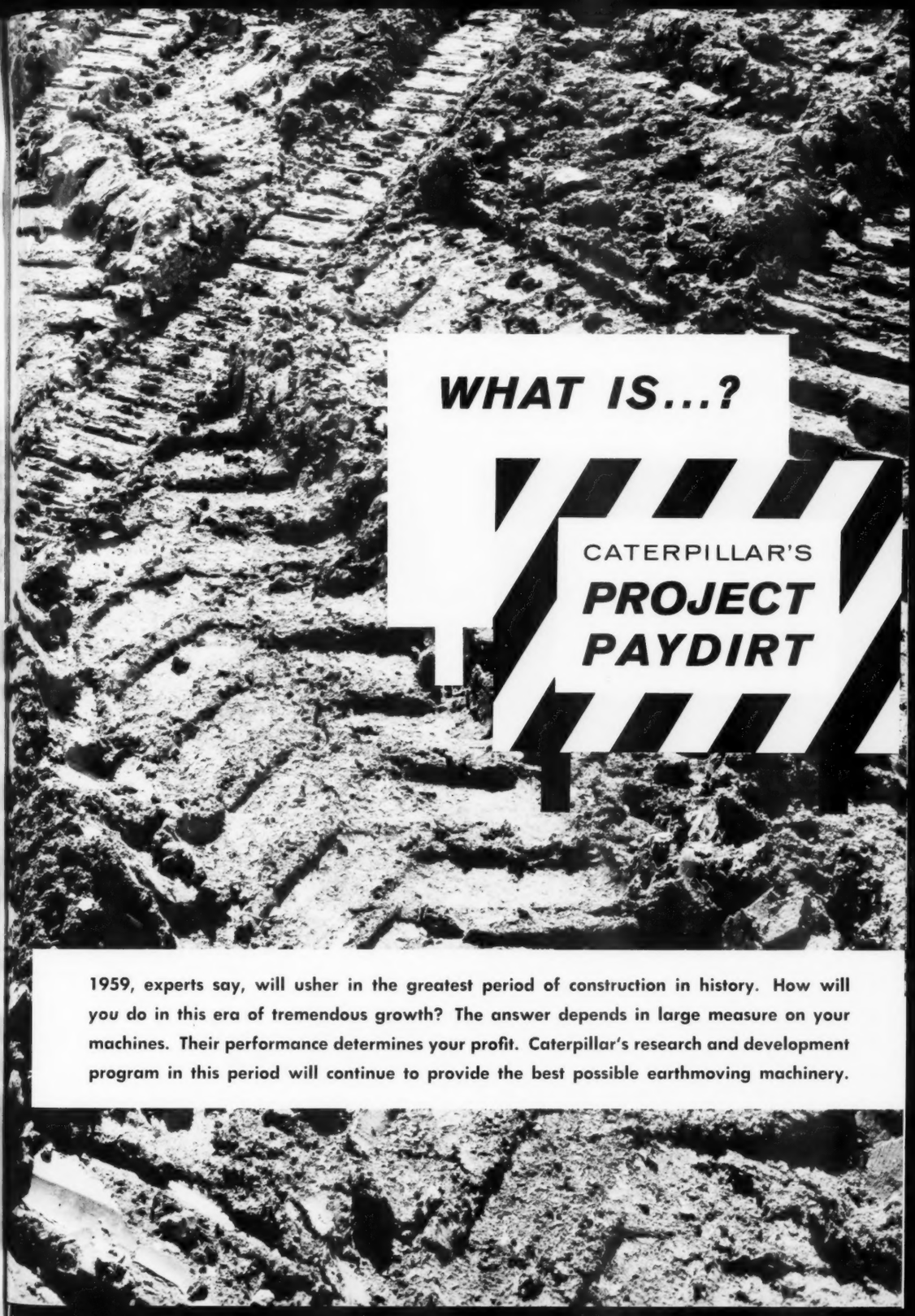
Allison Division of General Motors, Indianapolis 6, Indiana

Allison TORQMATIC

TORQMATIC® DRIVES

THE MODERN DRIVE FOR MODERN EQUIPMENT

For more facts, use Request Card at page 18 and circle No. 235



1959, experts say, will usher in the greatest period of construction in history. How will you do in this era of tremendous growth? The answer depends in large measure on your machines. Their performance determines your profit. Caterpillar's research and development program in this period will continue to provide the best possible earthmoving machinery.

CATERPILLAR'S
PROJECT
PAYDIRT

Project P

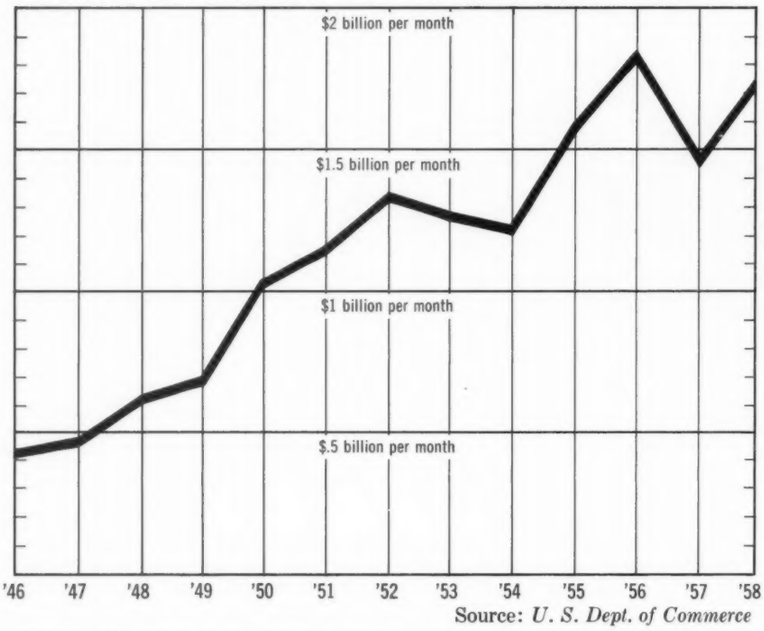
CATERPILLAR RESEARCH AND DEVELOPMENT

A multi-million-dollar research and development program at Caterpillar Tractor Co. is paying off for you in the most productive earthmoving equipment ever manufactured. It's PROJECT PAYDIRT—the big news in the construction field today.

Caterpillar research consistently has been first with the major developments in earthmoving equipment. Each development has meant more production and more profit for owners of Caterpillar machines.

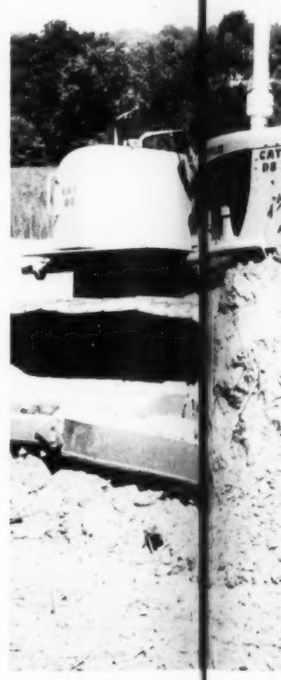
Since 1946 the money spent on heavy construction

GROWTH IN U. S. HEAVY ENGINEERING CONSTRUCTION



Source: *U. S. Dept. of Commerce*

SHARP INCREASE of money spent in U. S. on heavy engineering construction, both public and private, is shown in this graph. In 1946, a monthly average of $431 million in heavy engineering construction contracts was let. In the first eight months of 1958, contracts averaged nearly $2 billion ($1,717 million). By 1975, average monthly contracts of approximately $3.5 billion are expected.



HERE'S WHAT *PROJECT PAYDIRT* MEANS TO YOU!

As the amount of construction increases, more contractors will enter the field, and competition for the work will be intense. Machines may be the difference between profit and loss. There will be no place for anything but modern, heavy-duty machines—machines that can perform *profitably*, day in and day out, under severe conditions.

Caterpillar has these machines, a full line of quality, job-tested earthmoving equipment. And PROJECT PAYDIRT insures that the Caterpillar line will always be ready for the job ahead, regardless of changing conditions and demands. Proof of this lies in the past record.

Since the end of World War II the Caterpillar line has experienced a continuous growth. And in 1951 the DW20 and DW21 were introduced. These wheel-type tractors soon proved ideal power units for scrapers. Also from PROJECT PAYDIRT that year: the No. 90 Scraper, top producer with track-type tractors; and the HT4, a track-type hydraulic front end loader.

The workhorse D8 Pusher, designed especially for push-loading applications, was introduced in 1953, along with

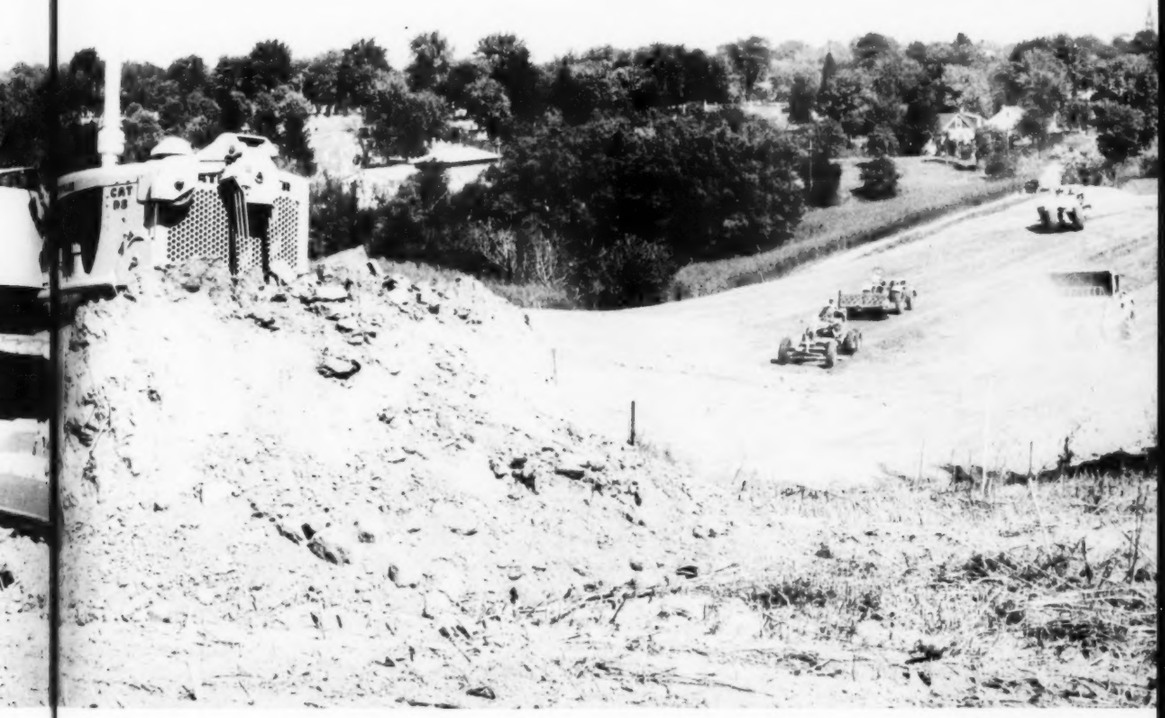
Paydirt

PACE GROWTH IN HEAVY CONSTRUCTION

in the United States has more than doubled. By 1975, experts predict, it will more than double again. Between now and then may well lie the country's greatest era of construction.

PROJECT PAYDIRT is Caterpillar's answer to the challenge of this explosive growth in heavy construction.

Money spent on heavy construction in U. S. has risen since 1946 from $5,172,000,000 to more than $20 billion. Experts predict that by 1975 annual expenditures will rise to more than $40 billion.



the No. 6 Shovel and the DW15, a smaller four-wheel tractor. 1955 brought the massive D9, king of the crawlers, equally effective as a bulldozer or for pushloading scrapers.

Also in 1955 came the three Traxcavators (Nos. 977, 955, 933), and the LOWBOWL Scrapers (Nos. 470, 456, 463), top producers that competitors still are trying to duplicate.

The Oil Clutch began setting new long-life standards in 1955. Also introduced in that year were other LOWBOWL Scrapers (Nos. 428, 435, 491), and tractor-mounted hydraulic Rippers (Nos. 4, 6, 8, 9).

In 1957, the Side Dump Bucket was offered as an attachment for the No. 955 Traxcavator, resulting in greater production through in-line loading. In the bulldozer line, the revolutionary Gyrodozer for the D7 Tractor began its career as the most versatile blade yet developed. PROJECT PAYDIRT was producing the equipment to match the growth in engineering construction.

The new Dry-Type Air Cleaner for the D9, DW20 and DW21 was introduced last month. This air cleaner removes 99.8% of all dirt in the intake air. And it requires only 5 minutes instead of the 20 formerly required to service the oil-type cleaner. That's 15 minutes more production time at each service period.

AND NOW CATERPILLAR'S PROJECT PAYDIRT BRINGS YOU...

LIFETIME LUBRICATED ROLLERS AND IDLERS

- **No routine servicing!**
- **Outwear conventional rollers and idlers!**
- **Feature new leakproof seals that can be re-used!**

Three million test hours under the toughest conditions prove this fact: new D9 lifetime lubricated rollers and idlers have no equals for low-cost, trouble-free performance.

Lubricated in the factory, they never need servicing again until they are rebuilt. They last far longer with less maintenance than conventional counterparts. Their new seals are leakproof and can be used again and again.

These outstanding advantages are the direct result of Caterpillar's new, exclusive concept in roller seal design—a metal to metal, floating ring seal.

Important as the new seal is, it is only one of many major improvements in the new D9 track roller. Major changes have also been made in rim, hub, bushing, outer sleeve bearing, roller shaft, end collars and lubrication system. These advances greatly extend roller life and effect substantial savings when rebuilding is necessary. See your Caterpillar Dealer today. He has the full story on what the new lifetime lubricated roller can mean to you.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co

BORN OF RESEARCH... PROVED IN THE FIELD

Manufacturer memos

Herchel M. Richey, vice president in charge of manufacturing for two divisions of Timken Roller Bearing.

Herchel M. Richey has been elected vice president in charge of manufacturing for the Roller Bearing and Rock Bit Divisions of **The Timken Roller Bearing Co.**, Canton, Ohio. Richey, who was formerly general factory manager of the company, succeeds **A. M. Donze**, who has retired. Donze will remain a member of the board of directors.

Lawrence E. Nelson and **C. C. Williams** have been appointed vice president of sales and divisional vice president, respectively, of the **Marine and Industrial Engine Division, Chrysler Corp.**, Detroit, Mich.

Nelson will establish an expanded Marine and Industrial engine center and dealer network throughout the United States and Canada, as well as develop and execute advertising and merchandising programs.

Williams will devote his work to the division's principal customers, government officials, and execute special assignments at the direction of the president.

The division has recently moved to 12200 E. Jefferson, Detroit. It is expected that manufacturing facilities will be completely moved from the Trenton, Mich., plant into the new quarters some time this month.

J. Leo Lamley has been appointed district sales representative for **Insley Mfg. Corp.**, Indianapolis, Ind., maker of shovels, cranes, and concrete-handling equipment. From Olympia, Wash., headquarters, Lamley will assist and coordinate distributor sales efforts in Washington, Oregon, Idaho, Montana, Alaska, and the provinces of British Columbia and Alberta, Canada.

The new Eastern credit manager for the **LeTourneau-Westinghouse Co.**, Peoria, Ill., is **Jack Rhodes.** He replaces **Donald E. Seghi,** who has been transferred to a special assignment for the firm's credit department. In his new position, Rhodes will handle liaison between the company and independent distributor organizations, which sell and service the LeT-WesCo line of earthmoving, grading, and heavy hauling equipment in 21 eastern states and four Canadian provinces. He will make his headquarters in the home office.

The new Midwestern District sales manager for the **Lull Engineering Co.**, St. Paul, Minn., is **Al Tietgen.** From Omaha, Nebr., headquarters, Tietgen will cover the territory east of the Rocky Mountains to the Mississippi River.

James H. Richardson has been appointed manager of the product development department of the **Wickwire Spencer Steel Division, The Colorado Fuel & Iron Corp.**, with headquarters in Buffalo, N. Y. Richardson previously served as a contact metallurgist for the firm's general wire sales department.

Hoyt Stout has been named regional sales manager in New Jersey, Delaware, and southeastern Pennsylvania for **Motorola Communications & Electronics, Inc., Division of Motorola, Inc.**, Chicago, Ill. From Elkins Park, Pa., headquarters, Stout will be responsible for the sales of Motorola's mobile, portable, and special 2-way radios.

Wallace Miller, whom Stout succeeds, is now the New York State manager for the company.

R. P. Nichols has been made product sales director for the Industrial Sales Division of **Preco Inc.**, Los Angeles, Calif. This division engineers, produces, and distributes a line of dozer back rippers, as well as an automatic blade control for use on the Caterpillar No. 12 motor grader, with distribution through Caterpillar dealers.

H. L. Clevenger has been appointed sales manager for Form-Crete products, manufactured by the **Florida Division, Food Machinery & Chemical Corp.**, Lakeland, Fla. From division headquarters, Clevenger will serve all states east of the Rocky Mountains.

H. L. Clevenger, sales manager for Form-Crete forms, manufactured by the Florida Division, Food Machinery & Chemical Corp.

Prior to this appointment, he was assistant to the general sales manager for Form-Crete casting forms.

Donald F. Nash has been named Florida sales representative for construction chemicals produced by the **Dewey & Almy Chemical Division, W. R. Grace & Co.**, Cambridge, Mass. He will work out of Fort Lauderdale.

To prepare new crushers for a hard life, Wasco County, Oregon, hardfaces rollers with Victor alloy rod. The rollers showed no discernible wear after crushing 3100 tons of extremely hard and abrasive basalt.

Lifesaver for new or used equipment **VICTOR Hardfacing Alloys**

Wasco County, Oregon, uses lots of crushed basalt. This rock crushes readily, yet is extremely hard and highly abrasive, consequently tough on rollers. So, as standard practice, Supt. Wayne Weeks hardfaces all rollers in brand new crushers, before ever they crush a single basalt rock. He reports hardfacing of new equipment prevents excessive wear of surface material, thus maintaining roller size during the work hardening period.

On this new crusher, he used 200 lbs. of Victor #0 semi-automatic wire, size 7/64", to hardface roller faces, and 50 lbs. of tube Victorite coated for finish work around the roller edges. Longer crushing life will quickly pay for the rod.

You, too, can save money and extend the life of equipment subjected to abrasion, impact and heat. Simply make it standard practice to hardface both new and worn equipment with Victor alloy rods. Complete line of 27 different hardfacing rods assures you a right rod for every hardfacing need. Full range of sizes for both acetylene and electric AC and DC applications, either hand, automatic or semi-automatic. Order a supply from your Victor dealer TODAY.

FREE Victor Hardfacing Manual shows you right rod to use and how to apply it. Write us NOW for your copy.

VICTOR for welding

Profitable dealerships open; inquire now!

VICTOR EQUIPMENT COMPANY 42

ALLOY ROD AND METAL DIVISION

13808 E. Imperial Highway, Norwalk, Calif. • Wakita, Oklahoma

For more facts, use Request Card at page 18 and circle No. 237

Before work starts, Vernon Jones, right, vice president of Treadwell Engineering Co., Arcadia, Calif., discusses engineering requirements with James J. Cecka, San Gabriel, Calif., for acreage on which Cecka will build a tract housing project.

Jones then takes the requirements for the earthwork to programmers Jack Gruben and Dudley Palmrose so that computer programming can be done.

Management

Computer cuts work load for civil engineering firm

Lights no longer burn at night in the offices of the Treadwell Engineering Co. of Arcadia, Calif., when a job deadline nears.

But not too long ago, Treadwell engineers worked evenings and weekends to handle large quantities of essential computations for a project, and there was a danger that the work would not be completed because of the slowness of making hand computations.

To cope with the problem of making a large number of computations with a minimum number of trained personnel, and yet providing clients with rapid and economical engineering service, Treadwell decided to put Royal McBee's Royal Precision LGP-30 electronic computer into use. And from the outset, there was a radical change in the working procedures.

The general-purpose computer, the

MODEL 15 A (flatbed)

MODEL 15 A (bucket)

MODEL M 30

MODEL L 10

PRIME-MOVERS OPERATE PROFITABLY ON MORE JOBS

than any other powered buggy. Outside or under roof, Model 15A PRIME-MOVERS put your materials where you want them. Little or no preparation required as these units use same runways, ramps or hoists you now have. Triple output of labor with same manpower. Regardless of the stage of your job, you can show immediate profit in placing concrete, brick or tile with PRIME-MOVERS.

PRIME-MOVER

PRIME-MOVER CO., Muscatine, Iowa

Please send job reports, estimating data and literature on PRIME-MOVER equipment for:

CONCRETE PLACING ☐; Model____

BRICK HANDLING ☐; Model____

Name_____

Company_____

Address_____

For more facts, use coupon, or Request Card at page 18 and circle No. 238

A BRIDGE IN TIME . . .

● Bailey bridge units being assembled by unskilled labor.

● Simple launching system cuts equipment costs.

. . . prevents blockage of highways

and allows vital road communications to remain open to traffic throughout the year. The Bailey bridge is invaluable also as an access bridge in the opening up of new territory and as a permanent structure.

● Completed emergency bridge replaces old bridge carried away by flooding.

BAILEY BRIDGING

Construction is speeded under all conditions with the versatile Bailey Bridge Special features include:

- Practically 100% salvageable.
- Low cost.
- Deck-type or Thru-Truss construction
- Chord-reinforcement for increased capacity without relative increase in weight.

U. S. REPRESENTATIVES

Timberland Machines Inc., 169 Front Street, South Portland, Maine

Mason and Bacon Inc., McClure Building, Frankfort, Kentucky

Bailey Bridge Co., 1767 Conejo Avenue, San Luis Obispo, California

Available immediately from stock

Telephone or write for illustrated literature

CONTRACTORS SERVICE LIMITED

38 COMMERCIAL ROAD • TORONTO, ONT.

Telephone HU 5-4424

Sole Distributors for Bailey Bridging in U.S.A. and Canada

WORLD LICENCEES FOR MANUFACTURE AND SALE

THOS. STOREY (ENGINEERS) LTD., STOCKPORT, ENGLAND

For more facts, use Request Card at page 18 and circle No. 239

Data collected is transferred by Gruben into the form required on a Friden tape puncher. Both this machine and Flexowriters, lower left, are equipped for punching tape for the Royal McBee LGP-30.

The punched tape then goes into the receiving gate at the left of the Flexowriter to feed information to the computer. The LGP-30 types out the answers to problems automatically and free from error.

size of a home freezer, is completely mobile, and has simplified controls so that it can be operated by persons with limited computer experience. The stored-program operation rapidly yields answers to such engineering problems as traverse closure, field stakeout, and cut and fill.

The advantage of the computer installation is illustrated by a recent project involving 5,500 lots. With the LGP-30, it was possible for five engineers to do a job that formerly would have required a staff of 30 engineers to complete in the same time. The economic value of the computer is also reflected in field operations. It is now possible for engineers to compute survey data for a wider range of field applications than was formerly possible. Ties for surveys can now be calculated on the computer to facilitate field operations.

(Continued on next page)

Use of the information supplied is discussed by Jones with engineers Wendell Cunningham, seated, and Bill Runge before output data goes to Treadwell's main engineering room.

GET THE TIE-WIRE PROBLEM

off your neck...

Workers recognize the danger of carrying re-bar tie wire in cumbersome shoulder coils—the ever present hazard of loose ends causing facial or eye injuries—the danger of being thrown off balance when the coil catches on a protruding object.

and put it where it belongs

They are equally quick to recognize the safety and convenience of using CF&I Cal-Tie Wire in our new, compact dispenser. It leaves both hands free • wire can't kink or catch • work in close quarters is easy and safe • no discarded coils to trip workers • speeds up job time.

Try Cal-Tie Wire in the new belt-borne CF&I handy reel dispenser. Together they weigh less than seven pounds. Are available in 14-through 20-gage annealed wire. Contact our nearest sales office for full details.

5935

CF&I CAL-TIE® WIRE

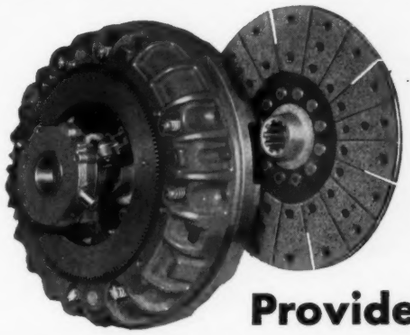
THE COLORADO FUEL AND IRON CORPORATION

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Denver El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Los Angeles • Oakland • Oklahoma City • Phoenix • Portland Pueblo • Salt Lake City • San Francisco • San Leandro • Seattle • Spokane • Wichita • WICKWIRE SPENCER STEEL DIVISION — Atlanta • Boston • Buffalo • Chicago • Detroit • New Orleans • New York • Philadelphia
CANADIAN REPRESENTATIVES AT: Calgary • Edmonton • Vancouver • Winnipeg

For more facts, use Request Card at page 18 and circle No. 240

ROCKFORD

NEW MORLIFE® CLUTCH FACING



Small Spring Loaded

Heavy Duty Spring Loaded

Oil or Dry Multiple Disc

Heavy Duty Over Center

Power Take-Offs

Speed Reducers

Provides

Heavy-Duty Torque with S-M-O-O-T-H Engagement

Smooth engagement and disengagement is a distinguishing quality of this NEW metal-base Morlife clutch facing. It provides the extra torque required by heavy-duty highway vehicles and off-highway equipment. Unusual heat dissipation and resistance to wear insure longer life—with less frequent adjustments and replacements. It will pay you to give *your* products these competitive advantages of ROCKFORD Morlife Clutches.

BW SEND FOR THIS HANDY BULLETIN
Gives dimensions, capacity tables and complete specifications. Suggests typical applications.

ROCKFORD Clutch Division BORG-WARNER
314 Catherine St., Rockford, Ill., U.S.A.
Export Sales Borg-Warner International — 36 So. Wabash, Chicago 3, Ill.

CLUTCHES

For more facts, use Request Card at page 18 and circle No. 241

Data from the computer is used by Treadwell engineers to determine the most economic use of the land; conversion of design dimensions to survey plans for staking of lots, streets, and property boundaries; and preparation and filing of subdivision maps and legal descriptions.

(*Continued from preceding page*)

Solves number of problems

The problems most frequently encountered by Treadwell—and which are currently being expedited by the LGP-30—include:

1. Computation of the area of a tract and areas of individual lots within the tract.
2. The most economic use of land area through the adjusting of lot sizes and boundaries.
3. Conversion of design dimensions to survey plans for the staking of lots, streets, and property boundaries.
4. Computation of survey ties to existing bench marks or monuments.
5. Level surveys for the control of grading and drainage.
6. Preparation and filing of subdivision maps and legal descriptions.

Calculating traverses

Calculations relating to traverses, which formerly required the highest degree of skill and consumed the most time, are now being programmed for the LGP-30. Eliminated are numerous hand calculations and the inevitable risk of human error in carrying out calculations by hand. The types of traverses currently being solved on the computer by Treadwell are calculation of the length and bearing of an unknown side of a traverse; all lengths known, two bearings unknown; all bearings known, lengths of two sides unknown; length of one course and bearing of another unknown, two solutions given; error of closure (EOC) of closed traverse; area of closed traverse.

The only hand operation now required is the transfer of physical dimensions from the map to the tape. It is no longer necessary to spend a lot of time looking up the values of angular functions, performing calculations on hand calculators, and manually recording results. The punched tape, with the physical dimensions, is placed in the LGP-30 and the computer is started. In seconds, the answers are computed, and the results are neatly and automatically typed out, free from mathematical errors.

Typical problem

In a problem involving traverses, the existing data starts with the number of sides in the traverse, including the closing side. The direction, bearing, and length of each course are then listed in sequence. The accuracy used is the same as that normally used in hand calculations; angles are recorded to the nearest second, and length to the nearest .01 foot. Stop codes, placed at the end of each completed item of data, instruct the machine to store the completed value for subsequent computations.

The information that appears on the typed sheet is simultaneously punched on paper tape, which provides a means for rapid feed into the computer as well as a storage tape for re-use. After the data is fed to the computer and the computations are completed, results are printed out by the tape typewriter attached to the LGP-30. The form of the output—spacing, line length, headings, or any other information—can be programmed in advance to provide the desired data.

The final results for the problem type selected are printed under the reproduced data. If, in addition to the unknown length and bearing, the area is desired, the transfer control button is depressed and the northings and eastings are printed out for each course. The area is then calculated and the results printed. The area is given to the nearest .001 acre for areas larger than one acre, to the nearest 0.1 square foot for areas of less than one acre.

The LGP-30 program in use at Treadwell will accommodate traverses with as many as 64 sides. The

Tuffy® Wire Rope

"Preventative Maintenance" Will Give You Longer Wire Rope Service

Every motorist knows the importance of proper lubrication for cars. It's essential for wire rope, too. For wire rope is a "machine" of precision moving parts. And friction is enemy No. 1 of all machinery.

Lubrication during fabrication

There are two distinct phases of lubrication: in manufacture, and in use. Wire rope engineers consider the lubricant as part of the rope; the kind, consistency and amount of lubricants are controlled and applied as required. Applications are usually made hot for the inside and external surfaces.

Lubrication in the field

Here only an external application of lubricants is possible. It must penetrate to the inside of the rope to get a film of oil between the strands and the core. The lubricant can be applied either hot or cold, depending on its penetrating quality.

To find the best lubricant for your wire rope, talk to a local oil company engineer. He'll recommend the oil and method of application best suited to your needs.

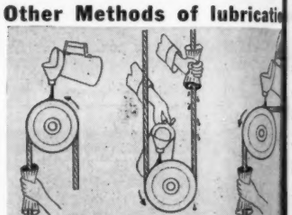
How much and how often?

There's no set rule. It depends on service conditions. The heavier the duty, or the greater the number of bends, or the more corrosive the fluids in which the rope operates, the more frequent should be the lubrication. Remember one thing. The core is not an oil reservoir for external lubrication of the rope. No such action takes place. The oils "built" into the fiber core during its fabrication are to preserve and lubricate the vegetable fibers, not the external steel wires.

Two Types of "home-made" oiling devices

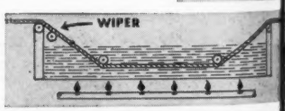
They're simple and do a good job. One is for vertical ropes, the other for horizontal. A heavy crankcase oil, cylinder oil or similar lubricant, preferably heated, is placed in the lubricators when the rope is run through.

Other Methods of lubricatio



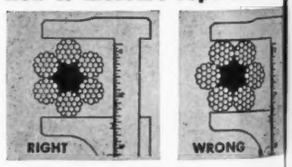
The pour-on method for manual lubrication effective when penetrating, yet adhesive, oi used. Oil should be hot. Hold the wiping s BEHIND the sheave. This catches any excess that would be carried on along the rope.

Metal split box for bath treatment has a burlap collar or wiper at outlet end.



Hot bath method of applying heavier-bodied lu cant at high temperature. Gas burners or st heat may be used. Pre-heated lubrication is als more penetrating. Rope should run through st to insure penetration.

How to measure rope diamete



Use a machinist's caliper. Be sure to measure widest diameter.

How to measure tread diamete

Select smallest sheav drum to be used w new rope, and meas actual diameter of tre

Sheaves with groo corrugated with rope impression should be placed with new before installing wire rope.

New ropes are usually over-size. It is advis to have groove diameters of sheaves or drum large as the actual calipered diameter of the rope, or slightly larger. We recommend sizes as follows:

limiting conditions are as follows: (1) The maximum allowable length of any one side is 8,192 feet. (2) The sum of the northings or eastings cannot exceed plus or minus 65,536. (3) The bearing of a side cannot exceed 90 degrees.

Follows hand method

The LGP-30 program of computation parallels closely the method of hand solution. The physical dimensions required are the same as those recorded for manual methods. This system of paralleling operations permitted the transition from manual computation methods to solution by the LGP-30 with a minimum of personnel training. The only additional training required of the engineering personnel was in the operation of the tape-punching device mounted on the computer.

Data on tape

The time required for the preparation of data tapes is kept to a minimum by equipping each engineer with a tape typewriter for type punching right at his desk. As the physical dimensions are determined by the engineer, the quantities are transferred to the data tape. The data also appears as a typed listing for checking and error detection. Data punching errors can be corrected by backspacing the tape, deleting that portion in error, and repeating the corrected value. With the skill acquired by the engineers in the use of these units, data can now be prepared as rapidly as the information was formerly recorded on work sheets for hand computations.

The completed tapes are then taken to the LGP-30 for computation. The tape is placed in the read position and the computer started. The data tape is read in, course by course, and all required mathematical operations are performed. Also, the data is printed in sequence on the output form. After processing all data given, the computer calculates the final values of unknown side, or error of closure and its bearing. If areas are required, the transfer control button is depressed and the northings and eastings are printed out and the area of the transverse computed and recorded. If the area is not desired, the program is automatically transferred to begin the input of a new set of data.

An illustration of the savings realized through the application of automatic computer techniques is shown by the experience with a typical problem at Treadwell. The time required to prepare the data tape amounted to about five minutes. The computer operation required about two minutes, including data read in and output printing. The same problem would require, by hand methods, the service of an experienced engineer for at least one hour, as compared to only seven minutes required with use of the computer. The advantages realized by Treadwell, through the use of the LGP-30, are reflected in all aspects of the firm's operations. There has been a marked increase in the productive capacity of the engineering staff. The rise in the work potential of the engineers has made it possible to schedule completion dates more accurately.

Of greater importance is the increase in the accuracy of the work now being performed. There has been a reduction in the variable time formerly allocated for checking computations and correcting errors. The high degree of accuracy of the computed values by the LGP-30 reduces to a minimum the supervisory time formerly required for checking engineers' work.

Projects are now being scheduled more efficiently in the various work classifications. A smaller staff of engineers now effectively utilizes the work capacity of a larger group of draftsmen. The increased uniformity and legibility of computer output have resulted in the more accurate and efficient transfer of computed values from designers to final maps.

More efficient scheduling of jobs also has eliminated the need for overtime and weekend work on the part of the staff. This has reduced overtime costs as well as improved employee morale. From the company's point of view—and from the engineer's point of view—the LGP-30 is proving its worth. THE END

ARBA surveys salaries of highway engineers

Salaries of state highway engineers have risen an average of 16 per cent in the last two years, the American Road Builders' Association reports in its fifth survey of "State Highway Engineers' Salaries". However, the survey has found that the salaries in most states are still lagging behind the minimum recommended by the American Association of State Highway Officials.

The ARBA report shows that during the 2-year period between the surveys, every state, the District of Columbia, Hawaii, and Puerto Rico have increased salaries in some grades, with increases in all grades in 29 of the agencies reporting. The survey is part of ARBA's active program aimed at improving the status of highway engineers.

Copies of the survey may be obtained from the ARBA, World Center Bldg., Washington 6, D. C.

Tips

Too much strength can be a weakness... Wire rope must be BALANCED

Sometimes extra strength is heavily stressed in selling wire rope. While strength is important in every operation where wire rope is used, it is not the only important quality, and there are cases where excessive strength is a liability.

For example, the manufacturers of scrapers have designed the components of their equipment to take certain loads. These loads are controlled by or subject to the ultimate strength of the rope. Larger ropes with their accompanying higher strength do not break but *the equipment itself begins to* break up. Another feature of scraper rope is resistance to crushing. Strength is not the factor which controls the best design to resist crushing.

Union Wire Rope gives you the PROPER BALANCE of strength, toughness, flexibility and other properties most desirable for rope efficiency and long life. Don't settle for less. Your Union Wire Rope distributor has the BALANCED rope for every use.

Recommended sizes:

Diameter of Rope	Minimum Dia.	Maximum Dia.
1/4-5/16	+ 1/64"	+ 1/32"
3/8-3/4	+ 1/32"	+ 1/16"
7/8-11/8	+ 3/64"	+ 3/32"
11/4-11/2	+ 1/16"	+ 1/8"
15/8-21/4	+ 3/32"	+ 3/16"
23/8 and larger	+ 1/8"	+ 1/4"

How to check groove diameter:

Ordering is ABC-Simple!

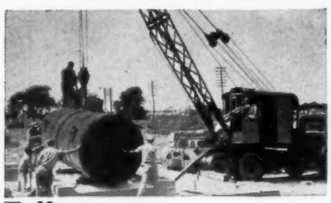
No complicated codes or long list of specifications. Just say "Tuffy," give type (Scraper Rope, Dozer Rope, etc.), length wanted and size. Just that easy!

Good Man to Know— Your Nearby Union Wire Rope Distributor

Whether your wire rope need is a scheduled replacement or a red-hot emergency, your Union Wire Rope distributor is ready with "right-now" service. He keeps varied stocks of Union standard constructions and the Tuffy Special Purpose Ropes. And he's backed by quick service from his nearby Union Wire Rope depot.

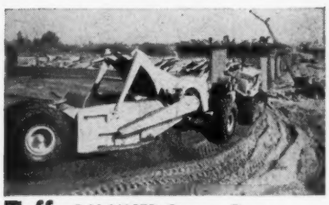
If it isn't rope you need, but advice on a wire rope problem, he's just as ready to help. If you don't know your Union Wire Rope distributor already, look under "Wire Ropes" or "Slings" in your telephone directory yellow pages.

Special Purpose Ropes: tailored & BALANCED for special uses



Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.



Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.

Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

union Wire Rope corp.

SUBSIDIARY UNITED STATES STEEL CORPORATION

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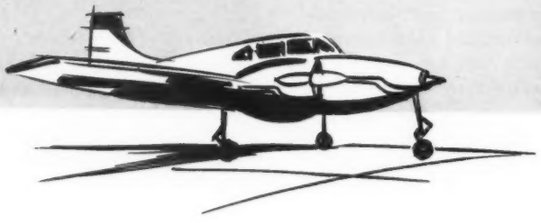
Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

For more facts, use Request Card at page 18 and circle No. 242

Dealer's planes give contractors

Service with Wings



Not for B. F. Goodrich Hi-Torque Brakes

On a grade like this, chances are the operator of a tractor-scraper combination could not depend on conventional brakes for most efficient spreading control. With B.F.Goodrich Hi-Torque Brakes, down hill spreads can be accurately placed and controlled for proper depth.

B.F.Goodrich Hi-Torque Brakes also allow the operator to work faster—and with greater safety—even on terrain that was formerly considered unsafe. With B.F.Goodrich Hi-Torque Brakes the operator can *stop twice as fast* as he can with conventional brakes, and with no fear of brake fade.

The secret of this vastly superior performance is *full circle stopping power.* This exclusive design provides more lining contact area and more constant lining pressure than any other drum brake. Hi-Torque Brakes require no lubrication and have an automatic adjusting feature which eliminates maintenance throughout lining life. Lining changes can be made with standard hand tools.

Next time you buy dump trucks, tractor-scrapers or other wheeled off-road vehicles, be sure to *specify* B.F.Goodrich Hi-Torque Brakes. You'll not only reduce cycle time, you'll cut expensive maintenance, too.

Ask your equipment manufacturer for information. Or write: *B.F.Goodrich Aviation Products, a division of The B.F.Goodrich Company, Troy, Ohio.*

B.F.Goodrich ***Hi-Torque brakes***

For more facts, use Request Card at page 18 and circle No. 243

Distributor doings

Flying a salesman, earthmoving consultant, service technician, or company executive to a contractor's remote job location in a hurry has often helped Peterson Tractor Co., San Leandro, Calif., make a sale or keep a customer satisfied.

The company's single-engine Beech Bonanza and its Beech Twin Bonanza are in almost daily use, providing exceptional service to customers and saving many hours of valuable time for busy executives and other important personnel.

Peterson, a Caterpillar dealer, actually has sales territories in two relatively small areas in California. One is the San Francisco Bay region served by the San Leandro plant, while the other, to the north, is served by stores in Redding and Chico.

But some of the firm's major customers have projects scattered throughout the western half of the country. By using the aircraft as sales and service tools, this distributor competes on equal footing with the local distributors throughout the areas where the jobs are situated.

The two planes serve the company in quite different ways. The single-engine Bonanza is used primarily as a sales tool by one salesman, A. M. "Red" Holman. It enables him to cover an 11-state area ranging as far from home as Montana and North Dakota. Red flies the plane himself and usually travels alone.

The Twin Bonanza, which seldom ranges so far from its home base at the Oakland Municipal Airport, provides fast transportation for company executives, technicians, and customers. It is usually flown by chief pilot W. A. "Bill" Giannotti and commonly carries a full load of five or six passengers.

Have own landing strip

Currently, frequent trips are made to Chico, where a new store is under construction. This new facility includes a 2,500-foot-long private landing strip, adjacent to the plant on the company's property. Company and customer planes will use the strip.

The six-place Twin Bonanza is equipped with two Lycoming 275-hp engines and has a cruising speed of 194 mph. It carries 180 gallons of gasoline in four tanks and has a safe cruising range of six hours, or well over 1,000 miles. The ship is fitted with complete instrument flying facilities and has an approach coupler and a Lear Auto-Pilot.

Although several of the company personnel are pilots, including executive vice president R. A. "Buster" Peterson and used-equipment manager Joe Salvador, the ship is usually flown by chief pilot Bill Giannotti. Bill has been flying since 1939 and has logged more than 7,800 hours in the air—about 1,000 of them for Peterson Tractor Co.

Giannotti graduated from the Civilian Pilot Training Course at San

Jose State College, instructed military pilots at Chaffey College of Aeronautics, Ontario, Calif., flew with the Ferry Command, and served as an adviser in aeronautics to the Indonesian government. He is currently a CAA flight examiner, issuing pilot licenses and ratings. He is employed on a full-time basis by the Peterson firm in the dual capacity of pilot and used-equipment salesman.

Visit job sites

In addition to making frequent trips to the outlying stores, the Twin Bonanza flies company personnel to customer locations where scheduled air service is not available, or when schedules are not satisfactory. Typical of these are the frequent trips to the big Trinity Dam project in northern California.

At the very start of the big earth-dam job, executive vice president Peterson and his earthmoving consultant, Kenneth F. Park, flew to the site several times to advise the contractor on problems relating to the types of soil and methods of moving it. A result of this, and of some special equipment modification made in the Peterson shops, is that the company supplied a substantial portion of the earthmoving equipment for the big project.

The landing field at Trinity Dam is a small strip right at the base of the Trinity Alps. Taking no chances, pilot Giannotti traveled to the site by automobile and walked over the landing strip before the first flight.

Bring customers to plant

Air service has helped the firm to acquire some good customers. In one instance, a Peterson salesman found a contractor and his project manager just too busy for an automobile trip from the job to Peterson's San Leandro plant. Although the salesman extolled the merits of the Peterson parts service and other plant facilities, he just didn't get the business.

Finally, he suggested a quick flight to San Leandro, to give both the men a firsthand look at the facilities there. The contractor agreed, and the next day Giannotti and the Twin Bonanza picked them up at an airstrip near the job site. In a few hours they had flown to San Leandro, visited the Peterson plant, and were back at the job site. Impressed by the plant facilities and the travel accommodations, the contractor began buying parts and equipment and became a valuable customer.

Improvised airstrips

Many contractors are becoming increasingly aware of the advantages of air service to jobs both large and small. Consequently, when landing facilities are not available near the job sites, the contractors often build a strip of one kind or another. On large jobs this may mean a special airstrip; on the smaller jobs, con-

(Continued on next page)

W. A. "Bill" Giannotti, chief pilot and used-equipment salesman for Peterson Tractor Co., San Leandro, Calif., checks the cabin of the company's Beechcraft Twin Bonanza before taking off on a flight from Oakland Airport.

Want a permanent drainage structure?

Use Corrugated Metal

How long does a Corrugated Metal Drainage Structure last? Nobody can tell you for sure. Since the time the first Corrugated Metal Culvert was developed in 1894, many thousands of feet of Metal Drainage Structures have been installed, and some of the early structures are still in use. Often, individual structures outlasted the need for drainage, so they were removed and installed in other locations.

Information which has been developed from field inspections of existing drainage applications proves that Corrugated Metal Drainage Structures are durable from the important strength and material standpoint and will give long and satisfactory service in modern construction.

Write for our free booklet "USS Culvert Sheets" which tells you how to get the kind of service you can expect from Metal Drainage Structures made from USS Galvanized Culvert Sheets. It's loaded with information about selection of correct structure sizes, preparing foundations and installation procedure.

For your free copy, write to United States Steel Corporation, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Supply—Steel Service Centers
United States Steel Export Company

USS **United States Steel**

A complete check of the single-engine Beechcraft Bonanza is made by A. M. "Red" Holman before takeoff on a flying sales trip. He uses the plane to cover an 11-state area that ranges as far as North Dakota.

Red Holman gets ready to start the engine of the single-engine Bonanza. In a typical week's trip, the plane might cover 6,000 miles.

VULCAN

VULCAN TOOLS are sold by distributors throughout the United States and Canada

TOOLS TOUGHER THAN THE TASK

If you want BREAKING TOOLS — not TOOLS BREAKING, the only test other than actual use is to determine the extent to which skill and care have been applied in the production of the tool.

The Vulcan Tool Manufacturing Company guarantees quality by adhering to exacting production techniques.

Steel — Correct chemical composition and physical characteristics for each type tool.

Process Controls — Time and temperature controlled furnaces and modern manufacturing techniques are your guarantee of VULCAN QUALITY

Blast Cleaned and Inspected — Blast cleaned after tempering, then visually inspected and tested for the slightest imperfection.

Protected — Transparent rustproof coating protects every tool.

Specify **VULCAN** *for:*

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- **CHIPPING HAMMER TOOLS**
- **CLAY DIGGING TOOLS**
- **DRILL STEELS**
- **ELECTRIC HAMMER TOOLS**
- **HAND TOOLS FOR CONCRETE, STONE, AND STEEL WORKERS**

VULCAN TOOL MANUFACTURING COMPANY

41 LIBERTY STREET, QUINCY 69, MASSACHUSETTS

Specialists in the Design and Production of Pneumatic Tool Accessories

For more facts, use Request Card at page 18 and circle No. 244

GARRISON

POWER STEERING

Now available for

DIAMOND T TRUCKS

Models 830-42M, 730-32M, and 830-36M

Drivers say they like Diamond T Trucks because of their excellent ride, faster shifting and *easy steering*—thanks to Garrison Power Steering.

With hydraulic power doing 80% of the work of turning, drivers get rigs in and out in a hurry, with far less fatigue. Equipment takes less of a beating, too. Shocks from rough terrain are absorbed by the power cylinder—not the steering mechanism.

Garrison Power Steering is available for larger models of Diamond T Trucks and can be installed as optional equipment at the factory, or provided in kit form for field installation. Get in touch with your Diamond T dealer today for complete information.

Garrison Power Steering is available for most other makes and models of heavy and medium trucks, truck cranes, and wheeled material handling and off-the-road equipment.

4609 East Sheila Street
Los Angeles 22, California

For more facts, use Request Card at page 18 and circle No. 245

(Continued from preceding page)

tractors frequently lay out a section of haul road or even a portion of a new roadway for a landing strip. These improvised airstrips serve many purposes, and even make it possible for the site to be served by charter ambulance planes that take injured men to hospitals.

The strips also make it possible for Peterson Tractor Co. to bring sales and service personnel right to the jobs and to fly in badly needed parts. These haul roads are generally used as landing strips during lunch periods or off-shift hours.

Although the Twin Bonanza has been flown as far as the Caterpillar factory at Peoria, Ill., Peterson personnel find it equally useful on short jaunts. The trip to Trinity Dam takes an hour and twenty minutes each way; the round trip by automobile takes at least two days. A visit to a customer in nearby Marin County takes 10 or 15 minutes flying time from Oakland Airport. By car, this is a 1½-hour drive if traffic isn't too heavy. The saving in time and the elimination of driving in heavy traffic mean a lot to a busy company executive, and they eventually mean dollars on the black side of the company's books.

Makes long, fast trip

The single-engine Bonanza probably plays a more spectacular part for the company than its "Twin" sister. With Red Holman at the controls, it ranges over a large part of the western United States, visiting offices and job locations of contractors in cities and remote areas.

Before starting on a typical one-week trip with the 4-place Bonanza N724D Holman makes a thorough personal check of the plane's operating gear. Then, taking off from the Oakland Municipal Airport, Red heads east and climbs up through the haze which characteristically shrouds San Francisco Bay in the early morning.

Throttled back to about 65 per cent of its 225 horsepower for the climb, the Bonanza drones over the coastal mountains and the wide, fertile central valley toward the Sierra Nevada range. At about 9,000 feet, Red plugs in his oxygen supply to supplement the rarefied air and keeps climbing to

his flight-plan altitude of 14,500 feet. Here the engine is throttled back to cruising horsepower at approximately 173 mph.

At this elevation, a favorable tail wind boosts the ground speed to over 200 mph. Red takes no chances with the weather. Although the Bonanza is equipped for instrument flying, Red flies "VFR" only.

Red is hardly an amateur at the flying game. He started flying in 1931 as a hobby and put the hobby into practical use when he began executive flying in 1952. He has logged a total of more than 3,350 hours in the air. But he uses instrument flying only for an emergency.

After crossing the multihued mountains and valleys of Nevada, the plane begins its descent over the salt desert of Utah, and drops down over Great Salt Lake for the landing at the Ogden airport. Here, the plane is fueled and serviced. Red makes a call, gets a bite of lunch, and then double checks the plane before taking off. The plane carries 50 gallons of fuel in its three tanks, giving it a safe cruising range of four hours, or some 900 miles.

Climbing over the Wasatch Mountains, Red heads across the mile-high Wyoming plateau, arriving at his destination early enough for an afternoon and evening of important business. In 6¾ hours of flying time, Red has covered some 1,200 miles and made two calls. By automobile, this would have taken two days of hard driving.

Lands on highway

At about ten o'clock Tuesday morning, Red takes off for a construction project where there is no airport. The contractor stops traffic on a section of the highway while the Bonanza makes a landing. Completing business at this job in 1½ hours, Red rolls the plane back onto the highway for a takeoff.

This time, the destination is another project office some 120 miles to the south, where business is quickly transacted. Heading back to the northeast, he stops briefly at Rapid City, S. Dak., for fuel and service and continues on to Bismarck, N. Dak., for the Tuesday night stop.

Wednesday morning, Red is off to an early start to visit a big air-base construction project where he has a 5-hour conference with the contractor's personnel. He gets away in time to fly to Billings, Mont., that night.

The next day's trip covers an area of scenic wonderland including some of Yellowstone National Park. But Red is too busy with the controls and radio and an occasional glance at the map to enjoy the scenery. Part of the time, however, the auto-pilot takes over, giving Red a chance to relax and look around.

Friday morning, after a quick stop for business, Red presses on over the Continental Divide to an airport where a contractor has a car waiting for a 27-mile trip to a logging area. Here, Red gives some special problems his personal attention. Back in the air by late afternoon, he flies across the state of Washington, landing at Astoria, Ore., at sundown.

It's a nonstop flight to Oakland on Saturday morning and after checking the plane in at the Beechcraft hangar, Red is home across the bay in San Mateo by 1:30 p.m. How many miles that week? By air, it was probably less than 4,000; by highway, it would have been nearer 6,000 miles. Red makes this trip two or three times a year, but it is just a typical week's work in his huge territory.

The plane is also used for short hops. Contractors frequently phone from a remote job site, asking for Holman to advise them on some equipment problem. Within hours he is at the site, sometimes 1,000 or more miles away. He may even bring parts with him to get the contractor's equipment back on the job in a hurry.

Planes carefully serviced

Both aircraft are hangared and serviced at Cochran Aviation, Inc., the Beechcraft distributor at the Oakland Municipal Airport. Ships are given regular 25, 50, 75, and 100-hour checks, and complete annual checks.

Before purchasing the Twin Bonanza in 1955, Peterson officials carefully studied a number of available aircraft. But the Beechcraft Twin Bonanza won out. It has plenty of

(*Continued on next page*)

Cleveland 110 speeds drainage improvement

The Job..... installing 20 miles of drain tile for improvement of drainage along the Pennsylvania Turnpike between Perry and Beaver Interchanges.

The Digging .... in hard shale under 10 inches of tough aggregate in the shoulder of the pike.

The Record..... the Cleveland boosted daily trench production 300% – to 2,400 feet per day. No other type of machine previously had been able to get more than 600 feet per day.

The Contractor.. Harrison Construction Co., Pittsburgh

accurate...fast...dependable...clean
— there's nothing like a Cleveland for trenching

The CLEVELAND TRENCHER Co.
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Good Everywhere

For more facts, use Request Card at page 18 and circle No. 246

ELIMINATE REPEAT MAINTENANCE JOB
Repair It Right with **KOTAL**
PROCESSED, ALL WEATHER, INSTANT USE
BITUMINOUS STOCKPILE MIXES
End those double and triple cost repair jobs right now! — jobs done with inferi mixes require constant checking and repeat repai Maintenance with Kotal Stockpile Mixes are one st – permanent — operations.

Use KOTAL PROCESSED BITUMINOUS MIXES for:
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TIME SAVING...LABOR SAVIN
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KOTAL Company

For more facts, circle No. 247→

power to get out of the small fields easily with its rated usable load capacity of 2,000 pounds. Since the engines will burn almost any grade of gasoline from 80 to 100 octane, the ship can be refueled at practically any place where gasoline is available. Other favorable factors are the excellent visibility from the cockpit and the relative ease of operation.

Like every other feature of an equipment distributor's plant, the aircraft must provide service to the customer to justify their cost. The planes not only do that, but also save enough time and travel expense to pay their own way. THE END

Napco Industries names Crab tractor dealers

Napco Industries, Inc., Minneapolis, Minn., has appointed 14 dealers to carry its new line of Crab tractors. The new dealers are Smith Booth Usher Co., Los Angeles, Calif.; Western Machinery Co., Denver, Colo., Phoenix, Ariz., and Salt Lake City, Utah; Casey & Emmert, Inc., Chicago, Ill.; Embry Bros., Inc., Louisville, Ky.; and Files & O'Keefe Co., Portland, Maine.

The other nine dealers are Construction Equipment Co., Detroit, Mich.; F. W. Domres Equipment Co., Manistee, Mich.; Machinery & Supplies Co., Kansas City, Mo.; Ace Equipment Co., Maywood, N. J.; Dravo-Doyle Co., Pittsburgh, Pa.; Porter Supply Co., Inc., Huntington, W. Va.; and Best Equipment Co., Milwaukee, Wis. Two Canadian distributors are Cartierville Machinery Co., Montreal, Que.; and International Agencies & Machinery Co., Vancouver, B. C.

Parker-Hannifin appoints

F. D. Johnson Co., 28815 Aurora Road, Solon, Ohio, has been named a distributor by the Parker-Hannifin Corp., Cleveland. The dealer will carry Parker re-usable Hoze-lok fittings and industrial hose assemblies.

Globe Machinery & Supply Co., E. First and Court Ave., Des Moines, Iowa, has also been appointed to handle these same fittings and assemblies.

T. D. Sandelius Co., 6122 St. Augustine, Houston, Texas, will carry the line of Parker tube and hose fittings. The dealer has a branch office at Baton Rouge, La.

Texas dealer adds two more Koehring lines

Texas Machinery & Equipment Co., Inc., 750 N. Grand Ave., Amarillo, Texas, has been named a distributor by the Koehring and Kwik-Mix Divisions of Koehring Co., Milwaukee, Wis. The firm, which has a branch office at 808 N. College St., Lubbock, has been assigned the northwestern section of the state as sales territory.

The Texas dealer also carries the Parsons line of equipment, and road rollers made by Buffalo-Springfield. Both firms are divisions of Koehring Co.

Manitowoc names dealer

Hartford Rental Sales Corp., 599 Franklin Ave., Hartford, Conn., has been appointed a distributor for that state by Manitowoc Engineering Corp., Manitowoc, Wis. The dealer will carry Manitowoc's full line of cranes, shovels, draglines, mobile cranes, and backhoes.

New B-L-H dealer

Lutherville Supply & Equipment Co., Front and Lincoln Ave., Lutherville, Md., has been appointed a distributor of Lima Austin-Western crushing, screening, and washing equipment, manufactured by Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Lima, Ohio. The dealer will cover the District of Columbia; Maryland, with the exception of Garrett and Allegany counties; and Kent and Sussex counties in Delaware.

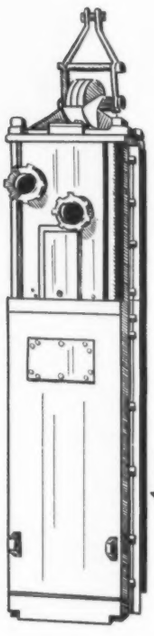
Two Worthington dealers

Worthington Corp., Harrison, N. J., has appointed two new Illinois distributors to handle its line of construction machinery. Both R. G. Smith Equipment Co., Inc., 1874 Busse Highway, Des Plaines, Ill., and Heil-Chicago, Inc., 7801 W. 47th St., McCook, Ill., will cover ten Illinois counties and two Indiana counties.

Free world's highways shown in Ford film

A 16-mm documentary movie, filmed on a trip around the world by two test drivers of a 1958 Ford car, has been released by the Ford Motor Co. The 25-minute color film shows seldom traveled routes close to the Russian border, southern Europe's capital cities, the northern mountains, and the plains and deserts of Turkey, Iran and Afghanistan. The film is available on a free loan basis and may be obtained by addressing the nearest Ford Film Library. Libraries are located at 16 E. 52nd St., New York 22, N. Y.; 4303 Telegraph Ave., Oakland 9, Calif.; The American Road, Dearborn, Mich.

WHY 3 DIFFERENT PILE DRIVING HAMMERS?
ONE OF THESE HAMMERS IS SUITED FOR YOUR JOB!



SINGLE-ACTING PILE HAMMERS ARE BEST SUITED FOR JOBS WHERE DENSE OR ELASTIC SOIL MATERIAL MUST BE PENETRATED OR WHERE HEAVY, LOW COMPRESSIVE STRENGTH PILES SUCH AS LONG HEAVY, PRE-CAST CONCRETE OR TIMBER PILES MUST BE DRIVEN~

DOUBLE-ACTING PILE HAMMERS OFFER HIGH PRODUCTION ON THE MOST COMMON PILE DRIVING JOBS WHERE MODERATE LENGTH AND WEIGHT PILES OF ALL TYPES: TIMBER, H BEAM, PIPE, STEEL-SHEET AND CONCRETE ARE TO BE DRIVEN THROUGH NORMAL GRANULAR SOIL~

DIESEL PILE HAMMERS BEST APPLY TO JOBS WHERE MOBILITY IS THE KEY TO ECONOMY. SUITED TO ALL TYPES OF PILES, THE DIESEL, WITHOUT NEED OF HOSE, BOILER OR AIR COMPRESSOR, EFFECTS REAL SAVINGS WHEN FREQUENT RE-LOCATION OF THE PILE DRIVING RIG IS NECESSARY~

McKIERNAN-TERRY CORPORATION
82 RICHARDS AVENUE DOVER, NEW JERSEY
MAKES ALL TYPES AND SIZES OF PILE HAMMERS ~ WRITE TODAY FOR LITERATURE ~

For more facts, use Request Card at page 18 and circle No. 248

PRODUCT PARADE

For further information on any of the products described in the following section, circle the designated number on the Request Card at page 18.

Extend equipment line with new rear-dump unit

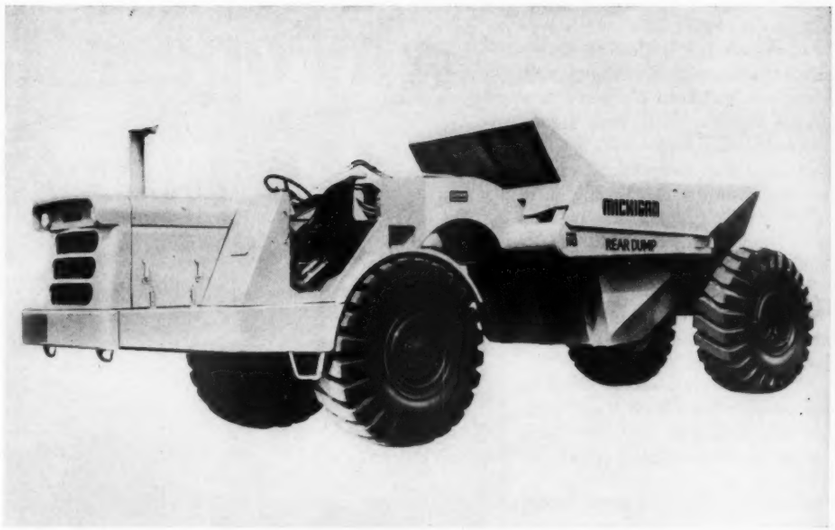
A 13-ton-capacity rear-dump, the Michigan Model 110 Tractor Wagon, is announced by the Construction Machinery Division of the Clark Equipment Co.

The Tractor Wagon is designed to haul rock and similar material that cannot be self-loaded by scraper. The unit's 7½-foot loading height permits it to be fed by virtually any power shovel, conveyor, or medium-duty tractor shovel. It has an SAE heaped capacity of 12 cubic yards and holds 8.3 cubic yards struck.

In the loading operation, the rear-dump's hydraulic system is completely shrouded to guard against damage from bouncing rock. When a dump is made, double-acting hydraulic cylinders tip the load out to the rear. The wheelbase shortens as rear wheels and axle pivot forward.

The 162 horsepower of the tractor can be used to assist in dumping extremely heavy loads. The operator simply locks the air-actuated rear wheel brakes and power-shifts into reverse.

For further information write to the Construction Machinery Division, Clark Equipment Co., Dept. C&E, Pipestone Road, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 109.



Diesel crawler tractor features 105-hp engine

A new 105-hp diesel crawler tractor, the International TD-15, is announced by the Construction Equipment Division of the International Harvester Co.

The tractor's engine has all-weather, push-button, gasoline-conversion starting. Other features of the engine include positive valve rotators, pressure-lubricated rocker-arm shaft, aluminum-alloy pistons, fully counterbalanced crankshaft, and and twin-plunger IH injection system.

Also offered is a new 6-speed single-stick full-reverse transmission. A shuttle-bar control permits instant reverse or forward motion without shifting. With a single lever, an operator can shift the transmission through any of the six speed ranges. This shift pattern, according to the manufacturer, allows full use of reverse speeds that are approximately 25 per cent faster than corresponding forward gears. A foot decelerator pedal to speed shifting is available as optional equipment.

Greater stability reportedly is attained with 6-roller track frames and new 1,000-hour, heavy-duty bushing-type track rollers said to lengthen maintenance periods appreciably.

For further information write to the Construction Equipment Division, International Harvester Co., Dept. C&E, 180 N. Michigan Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 110.

Speedex Tractor Co.'s new hitch makes it possible to operate mowers ahead of the tractor.

Hitch permits operation of front-mounted mowers

A new hitch, which makes it possible to operate gang mowers ahead of the tractor rather than behind, has been introduced by the Speedex Tractor Co.

Built of lightweight yet sturdy bridge-truss-type quality steel, the hitch has the necessary strength and rigidity to pull even the heavy-duty 3-gang mowers. Maneuvering around trees and other obstructions is easier and closer with mowers on the front, the manufacturer claims, and there is no matting down of grass by large tractor wheels ahead of the mowers.

The hitch is recommended for use by highway-department maintenance crews in mowing grass alongside parkways and on median strips.

For further information write to the Speedex Tractor Co., Dept. C&E, 367 N. Freedom St., Ravenna, Ohio, or use the Request Card at page 18. Circle No. 29.

Offer new air hammer for expansion anchors

The Model SP-500 air hammer for setting expansion anchors (concrete shells) in brick, masonry, block or solid concrete is announced by Superior Pneumatic & Mfg., Inc.

The unit is designed for use with air-hammer chucks available from Bulldog, Star, and other makers of

expansion anchors. According to the manufacturer, anchors as large as ⅞ inch can be quickly set with the SP-500.

This air hammer weighs only 4 pounds, is 9½ inches long, and has a metering trigger for controlling blows from 0 to 2,200. It uses 11 cfm at 90 psi.

For further information write to Superior Pneumatic & Mfg., Inc., Dept. C&E, 4758 Warner Road, Cleveland 25, Ohio, or use the Request Card at page 18. Circle No. 76.

New compact file holder for old, current records

The Rem-a-Dex pocket, a new file holder that brings microfilmed records together with current active records, has been announced by Remington Rand Division of Sperry Rand Corp.

With the new pocket, the inactive file is made part of the active file. Records of any sort can be microfilmed and housed in the active correspondence folder. When needed, they can be enlarged and prints made, or they can simply be referred to on a reader.

Rem-a-Dex pockets come in three standard sizes: 5 × 3¼, 6 × 4, and punched-card size. The pocket is of cellulose tri-acetate. Each pocket has a top and bottom fold-over, which holds the Kard-A-Film jacket, and adhesive material on the back in the form of a two-sided tape. Pockets are designed to attach to any straight-edge file folder. They are

Take it from the man in the driver's seat...here are big reasons

why operators recommend Pa
...to increase your daily pr

"The International Payscraper does not nose over or up in tight spots," states Operator Cecil Dickson, for C. & Z. Construction Co., Memphis, Tenn. The three "75's" in this fleet each get a heaped 22-yard load in 25-32 seconds—with the TD-24 as pusher. The job: building farm-to-market road near Covington, Tenn.

Operating safety is essential on mountain terrain. Ripon Construction Co., working near Weaverville, California, appreciate International "75" Payscraper safety — handling a subcontract on a road in mountainous Trinity County, with three "75's" and two TD-24's for pusher power. Cuts run to 75 feet deep

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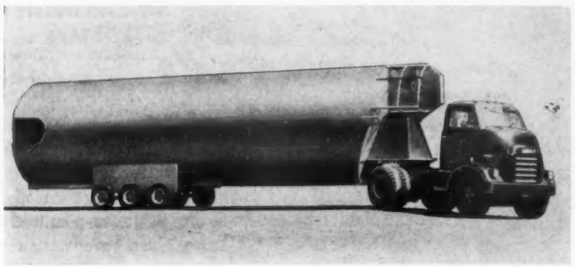
To obtain further information on any of the products described in this section, circle the number given at the end of the item on the Request Card at page 18.

placed in the folder so that they create the index guide for the folder itself.

For further information write to the Remington Rand Division, Sperry Rand Corp., Dept. C&E, 315 Fourth Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 35.



The silo is available with or without 30 to 50-barrel "upstairs" storage from which to charge a separate batcher. Manual or automatic scales are optional.

Portable cement silo offered in many sizes

A new portable cement silo is announced by Engineered Equipment, Inc.

An 8-foot-diameter model is offered with capacities from 125 to 250 barrels; the 10-foot-diameter unit has capacities from 125 to 460 barrels.

A bucket elevator is built integrally with and inside the silo to conserve space. Both sizes are available with or without 30 to 50-barrel "upstairs" storage from which to charge a separate cement batcher. Manual or automatic scales are optional.

Tandem pneumatic-tire towing wheels and a fifth wheel for attaching to a truck-trailer are standard.

For further information write to Engineered Equipment, Inc., Dept. C&E, 1001 Linden Ave., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 113.

Heavy-duty motor oil for heavy equipment

A new heavy-duty motor oil for gasoline and diesel-powered heavy equipment is announced by The Standard Oil Co.

Called Sohio HD S-1, the oil is said to withstand the rigors of operating conditions in extremes of atmospheric temperatures and high sustained engine temperature, high load operation, and intermittent operation.

For further information write to The Standard Oil Co., Dept. C&E, Midland Bldg., Cleveland 15, Ohio, or use the Request Card at page 18. Circle No. 56.

New unit produces 10,000 vibrations per minute

A one-man concrete vibrator with a 1 5/16-inch head is announced by the Whiteman Mfg. Co.

Electrically powered, the Model SEW weighs 16¼ pounds and can be slung over the shoulder in a harness. Despite its small size and light weight, the unit reportedly produces 10,000 vibrations per minute.

For further information write to the Whiteman Mfg. Co., Dept. C&E, 13020 Pierce St., Pacoima, Calif., or use the Request Card at page 18. Circle No. 65.

←For more facts, circle No. 249

Payscrapers production!

This new TD-20 is pusher for a pair of fast-loading "55" Payscrapers—on a street improvement project in Denver. Horn Construction Co. is the contractor.

Riding on the shock-absorbing, deep-padded seat, the International Payscraper® operator soon learns he can cross rough spots—ascend or descend steep pitches, loaded or empty—without neck-snapping, spine-smacking jolting or bouncing. He practically gets automotive riding comfort!

When he needs positive braking, he has powerful, heavy-duty four-wheel air brakes—synchronized on both tractor and scraper wheels—to decelerate and stop surely, even with heap loads on steep grades. And for "walking" the rig through soggy going, he has auxiliary hand-braking of the individual drive wheels!

Guiding a big earthmover is no longer an athletic event—no longer demands "muscle" or tussle! The Payscraper gives him exclusive Hydro-Steer—hydraulic steering powered for smooth, positive one-hand turns! Even the clutch is air-assisted for operating ease and fast, positive action!

And an operator has no fear of "nose-diving" or jack-knifing—not with International Payscraper design! The oscillating hitch assembly and forward pitched spindle prevents these machine contortions! Low center of gravity means extra stability, too, on uneven terrain.

These are big reasons why operators have the confidence to use full Payscraper power and speed—to give you full capacity and cycle-speeding loading, hauling, and return!

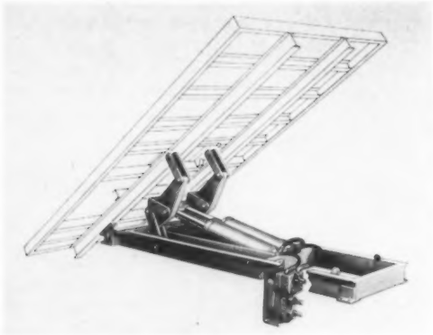
"Our three '55' Payscrapers are best for our land clearing and stripping needs in this sandy area—and we compared thoroughly with competitive machines," states Tom Hutchinson, for Hutchinson Bros., Inc., Pompano Beach, Fla. "We like the way the '55's' boil up a full load fast; then get to the fill and back quick."

Get in the driver's seat—get the operator's feel of International Payscraper performance. See for yourself what a big factor complete operating ease and confidence can be in increasing earthmover capacity! See your International Construction Distributor for a demonstration!

International® Construction Equipment

International Harvester Co., 180 North Michigan Ave., Chicago 1, Ill.

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors...Self-Propelled Scrapers and Bottom Dump Wagons...Crawlers and Rubber-Tired Loaders... Off-Highway Haulers...Diesel and Carbureted Engines...Motor Trucks...Farm Tractors and Equipment.



Tie-bar subframe construction and scissor-type lifting action are featured in the new Hercules 7 and 8-inch twin-cylinder lift-arm hoists. The units are designed for use on tandem-axle chassis in the 30,000 to 70,000-pound GVW range.

New lift-arm hoists for tandem chassis

Two new twin-cylinder lift-arm hoists are announced by the Hercules Steel Products Co.

The hoists, available with either 7 or 8-inch twin cylinders, are offered for use on tandem chassis with 84 to 120-inch C/T dimensions in the 30,000 to 70,000-pound GVW range. Both hoists are designed for use under bodies up to 16 feet in length.

One benefit of the new underbody hoists is said to be their specially designed linkage to the body. Travel of the hydraulic-cylinder piston powers the lift arm with a scissor-type action that results in exceptional smoothness of operation. The hoists also feature tie-bar subframe construction, which distributes lifting forces evenly.

For further information write to the Hercules Steel Products Co., Dept. C&E, Galion, Ohio, or use the card at page 18. Circle No. 81.

New kit offers clamps for variety of repairs

A new Clamp-Master kit, Model K-45, announced by the Punch-Lok Co., is housed in an all-steel carrying case finished in red baked-on enamel. The kit contains an assortment of 45 standard Punch-Lok clamps, including both preformed and open-end types, and a P-38 Loking tool for tensioning and locking all clamps.

The manufacturer emphasizes that after a Punch-Lok clamp is applied, there are no bolts or other projections to catch or snag.

Intended primarily for use in making hose connections and repairs, the Clamp-Master kit also offers a simple method for clamping, tying, mending, and banding of many other objects. Its use is recommended for repairing split planks, ladder rails, and tool handles; seizing rope ends; splicing cable; tying conduit; and wrapping pipe insulation.

The range of clamp sizes in the kit will accommodate objects from ½ inch to 10 inches in diameter.

For further information write to the Punch-Lok Co., Dept. C&E, 321 N. Justine St., Chicago 7, Ill., or use the card at page 18. Circle No. 15.

Offer new chain saw with balanced design

The Lombard Governor Corp. offers the Super Gladiator Model D-40A chain saw, featuring an equal distribution of saw weight at all points to reduce fatigue.

Available in 16 and 20-inch sizes, the saw also features a 4.7-hp engine and automatic chain oiling, adjustable according to type of wood and varying degrees of temperature.

For further information write to the Lombard Governor Corp., Dept. C&E, 68 Main St., Ashland, Mass., or use the Request Card at page 18. Circle No. 114.

NEW International® Drott TD with Four-In-One

CAPACITY... to outload 100 hp "single-action" rigs

PLUS VERSATILITY UNLIMITED... of exclusive clam-action

Sized, powered, geared, and controlled to decisively outproduce any "single-action" loader in the 100-hp field—the new 2¼ cu yd TD-15 4-In-1 gives you exclusive International Drott clamshell action!

Here's new big-job-sized versatility unlimited! Simply move the selector lever from the tractor seat with fingertip ease—to get any one of four big-capacity machine actions needed. On big job after big job, the TD-15 4-In-1 can replace costly limited-action machines one after another!

And whether this 4-In-1 replaces four or forty machine actions for you, you get it for one moderate price!

Smooth, years-proved, 115 hp 6-cylinder International diesel engine in the new TD-15 4-In-1 gives you full advantage of increased hydraulic system capacity—of new 6-speed, full-reverse transmission mobility—of new cycle-speeding forward-reverse Shuttle-Bar control!

Correct balance and long-track stability eliminate the need for counterweighting the TD-15 4-In-1. Track length on the ground is a full 98⅜ inches!

There's only one way to size-up new TD-15 4-In-1 performance—to measure its job range and capacity—to compare its money-making capabilities to a yard-full of one-purpose rigs. That's to get on the deep-cushioned seat and prove to yourself what it can do. See your International Drott Distributor for a demonstration!

"Concrete-bucking" pry-action break-out breaks up, digs up, and loads out old pavement — gives a big profit-advantage to the contractor, over single-action rigs that lack 4-In-1 *pry-over-shoe* power! The new TD-15 4-In-1 exerts the tremendous break-out force of 42,650 lbs.

As a "carry-type scraper" with cutting edge grading-off an even layer, and "boiling" the bucket full, the new TD-15 4-In-1 gives you a multitude of profitable uses. It can grade, strip, spread, or load-in-place a wide variety of materials with amazing accuracy!

International Harvester Company, Chicago 1, Illinois
Drott Manufacturing Corp., Milwaukee 15, Wisconsin

INTERNATIONAL® DROTT®

One of downtown Pittsburgh's worst traffic hazards, the Manchester Bridge Ramp, received the anti-slide treatment at its most dangerous section with abrasive-coated steel plates. The coating used was the Reliance Steel Products Co.'s Relcote, a nonskid resinous material embedded with carborundum grit and bonded to ⅜-inch 3 × 10-foot steel plates in this application. The plates were bolted to the rough oak flooring of the ramp to form two nonskid traffic lanes. Relcote's adhesive quality to steel in shear or in tension is said to be not less than 2,500 psi. It can be placed directly on concrete or asphalt roadbeds. According to the company, Relcote retains its nonskid qualities when wet or oil-covered, and is not affected by de-icing road salts. For further information write to the **Reliance Steel Products Co.**, Dept. C&E, 3700 Walnut St., McKeesport, Pa., or use the Request Card at page 18. Circle No. 102.

For more facts on these products, circle the indicated number on the Request Card at page 18.

TD-15

You'd need a heavy-duty blade outfit to match the earth-rolling material-digging performance of the new TD-15 4-In-1! You regulate dozing depth accurately with "radius control," hydraulically, from the tractor seat.

"Back-dragging" with exclusive clamshell action—new TD-15 4-In-1 reduces time and cost of "dressing" a bank—or pulling down material by the truckload! Shuttle-Bar control speeds up back-and-forth cycles on jobs like this!

Offer new packaged unit for pulling well casings

A packaged unit for pulling well casings, said to be capable of pulling 8 feet of 8-inch casing in only 30 minutes, is announced by the Greenlee Tool Co.

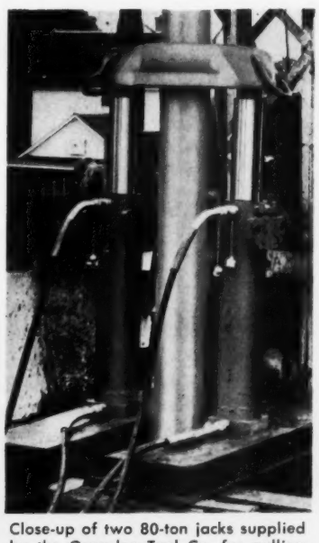
The unit consists of hydraulic jacks powered by a gasoline-engine-driven high-pressure power pump. Two or more jacks may be used to meet specific job requirements.

For maximum portability, the 10,000-psi pump, powered by a 4½-hp engine, is mounted on a channel-iron base. This enables the unit to be operated either from a truck bed or directly on the ground at the job site.

The pump is equipped with a 4-way valve that selects either the high-pressure advance stroke or the low-pressure return stroke to bring jacks back to starting position. Gage and charts are available to prevent overstress of the casing.

According to the manufacturer, the jacks are readily adaptable to casing clamps currently in use.

For further information write to the Greenlee Tool Co., Dept. C&E, 2136 12th St., Rockford, Ill., or use the Request Card at page 18. Circle No. 88.



Close-up of two 80-ton jacks supplied by the Greenlee Tool Co. for pulling well casing. Quick couplers used on this installation reduce time required in field setup.

←For more facts, circle No. 250

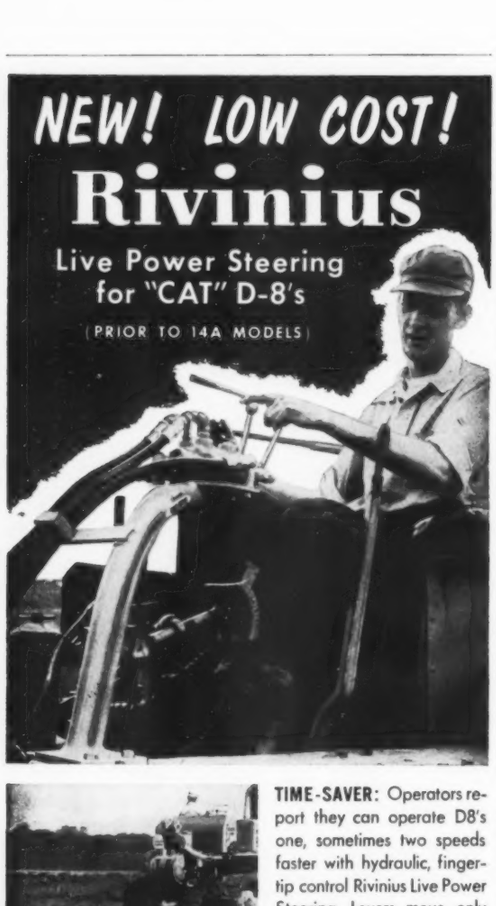
Workmen place permanent galvanized-steel forms for concrete bridge floors during the rebuilding of the 3-lane vehicle deck of the MacArthur Bridge across the Mississippi River at St. Louis. Called S-I-P bridge forms, they are available in 20, 18, and 16-gage thicknesses, with the pitch between corrugation ribs made to fit the spacing of the reinforcing steel that is designed for a particular bridge deck. Thus, the concrete that goes into the ribs of the form also serves as cover for the reinforcing bars. For further information write to the **Granco Steel Products Co.**, Dept. C&E, 6506 N. Broadway, St. Louis 15, Mo., or use the Request Card at page 18. Circle No. 52.

NEW! LOW COST!

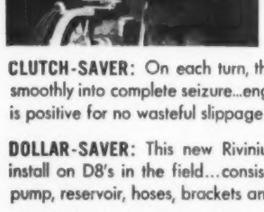
Rivinius

Live Power Steering for "CAT" D-8's

(PRIOR TO 14A MODELS)



TIME-SAVER: Operators report they can operate D8's one, sometimes two speeds faster with hydraulic, fingertip control Rivinius Live Power Steering. Levers move only 1½"; return automatically when released.



MAN-SAVER: Operator fatigue goes down...performance goes up! Rivinius Live Power Steering provides closer, faster control of D8 power and maneuverability.

CLUTCH-SAVER: On each turn, the D8's clutches are engaged smoothly into complete seizure...engagement and disengagement is positive for no wasteful slippage and clutch wear.

DOLLAR-SAVER: This new Rivinius system is compact, easy to install on D8's in the field...consists of hydraulic cylinder, valve, pump, reservoir, hoses, brackets and hardware.

SEE YOUR CATERPILLAR DEALER NOW OR WRITE

Rivinius, inc.

EUREKA, ILLINOIS

FOR "CATERPILLAR" MOTOR GRADERS: Torque Steering Booster ...Hydraulic Moldboard Shift...Snow Blower...Snow Loader

FOR "CATERPILLAR" D8 TRACTORS: Live Power Steering

For more facts, circle No. 251

For more data on any item described in this section, circle indicated number on card at page 18.

Liquid-cooled brakes for heavy-duty trucks

The Wagner Electric Corp. announces a new-type brake for use on heavy-duty trucks.

This new disk brake is designed to dissipate heat generated when a vehicle is stopped or slowed, through the use of a liquid coolant. It incorporates a disk with two friction surfaces, which turns with the wheel. When the brakes are applied, two liquid-cooled pressure disks are moved into contact with the turning friction disk to stop or slow the vehicle.

Besides the benefits of greater safety, through the elimination of brake failure due to excessive heat, and longer service life, the brake enables drivers to retain full control of their vehicles at normal rates of speed on level roads and steep downgrades.

For further information write to the Wagner Electric Corp., Dept. C&E, 6410 Plymouth Ave., St. Louis 14, Mo., or use the Request Card at page 18. Circle No. 92.

Powerful new puller handled by one man

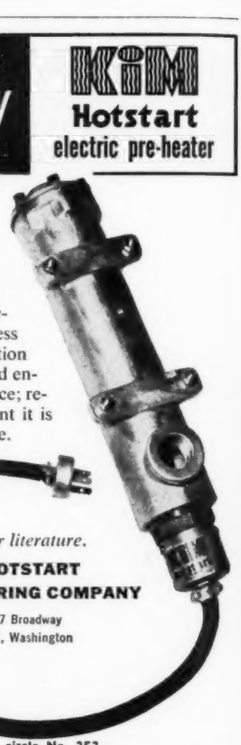
The Model C stake puller, said to exert 5,000 pounds pulling pressure when operated by a workman weighing only 150 pounds, is offered by the Holland Mfg. Co. It works on a fulcrum principle and is adjustable to six positions, allowing the operator to reach high and low stakes.

According to the manufacturer, the unit's adjustable jaws enable pulling of all steel stakes—round, angle, tee, channel, or square, from ¼ inch to 2½ inches in diameter. It also pulls wooden stakes and steel pipe or rods, as well as angled stakes and horizontal rods. It is 3½ feet long and weighs 17¾ pounds.

For further information write to the Holland Mfg. Co., Dept. C&E, Dept. A-118, 920 15th Ave., East Moline, Ill., or use the Request Card at page 18. Circle No. 91.

DIESEL ENGINES GO RIGHT NOW WITH...

KIM Hotstart electric pre-heater



Just plug KIM into the electric circuit. It draws cold water from the engine, heats it, then circulates it back through the engine. *Result*: quick starts regardless of cold weather; elimination of warm-up time; reduced engine wear and maintenance; responsive power the instant it is wanted. Thousands in use.

Write for literature.

KIM HOTSTART MANUFACTURING COMPANY

West 917 Broadway
Spokane 1, Washington

For more facts, circle No. 252

MOBILE OFFICE UNITS...

Save TIME... and MONEY!!!

MOBILE OFFICE Units are low in cost... Built to your specifications... There's a unit to fill your every need.

Because MOBILE OFFICE Units are easy to move from job to job, they enable you to have office, engineering, paymaster and other facilities at every point of your operation.

These units are economical, time saving, rugged and durable. They are self-containing, and are available with air-conditioning, and can be fitted to your specifications.

MOBILE OFFICES are being used by major contractors and other major businesses throughout the United States. In every case they have proven their worth.

Remember, whatever your needs may be, a MOBILE OFFICE Unit can be built to fill your requirements.

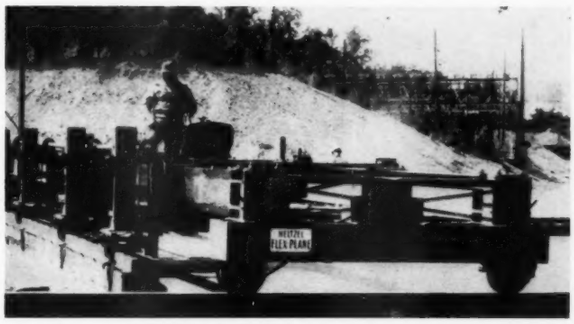
If It's Mobile... We Build It!

MOBILE OFFICE, INC.
Phones; DOrchester 3-1048-9

7314 Stony Island Ave., Chicago 49, Illinois

For more facts, circle No. 253

Variable-width machine for finishing operation



The new Heltzel finishing machine offers a wide range of finishing widths.

A new flexible-type deck-finishing machine, designed to finish a wider range of bridge and elevated-highway concrete slabs at greater construction speeds, has been developed by the Heltzel Steel Form & Iron Co.

The new machine is adaptable to finishing widths ranging from 24 to 44 feet. With relatively simple changes, it can be contracted to a 16-foot width.

The finisher consists of four main components clamped together with a new-type clamp said to make for easier assembling, dismantling, and adjusting of the rig to job application. New screed mountings and suspension and a new drive reduction reportedly enable the machine to deliver better straight-line action with a minimum of torque and distortion.

Individual hydraulic lifts raise and lower the screed from 24 inches below riding rails, with the wheels in the highest position, to 4 inches above the rails, with the wheels in the bottom position. The screed drive is vertically adjustable, with the screed permitting a more efficient operating angle and thus a smoother troweling action.

A quick-change device permits the screed to take any crown from 0 to 6 inches, from flat to full arc. Hung with clamps instead of bolts, the screeds are easier to mount and adjust. The new mechanical finisher travels from 3.5 to 13.4 fpm when screeding, and up to 48.4 fpm when not screeding. It reverses at speeds up to 98 fpm.

The rig is available with rear screed and/or hydraulically operated burlap drag. All components, including power train, are standard.

For further information write to the Heltzel Steel Form & Iron Co., Dept. C&E, Warren, Ohio, or use the Request Card that is bound in at page 18. Circle No. 30.

Portable batch plant available in two sizes

The Aeroil Products Co. announces a new portable concrete batching plant.

Available in two sizes—3½ and 6 yards—the plant is 4-wheel mounted, and is available with either a gasoline-engine-drive or electric motor. Water meters are optional equipment.

A 3-beam scale with over-under indicator is furnished as standard equipment. Dial scale heads are optional. The total weight of the plant is approximately 7,500 pounds. Over-all width is 7 feet, and over-all length is 36 feet 6 inches.

For further information write to the Aeroil Products Co., Inc., Dept. C&E, 75 Wesley St., South Hackensack, N. J., or use the Request Card that is bound in at page 18. Circle No. 48.

Exceptional performance of 7 other International engines in the Blow & Cote fleet caused the contractors to repower this Bucyrus-Erie 30-B shovel with an International 6-cylinder diesel.

How contractor minimizes maintenance with 8 International-powered machines

Blow & Cote, Inc., road builders from Morrisville, Vt., have a sure-fire solution for getting extra engine life with minimum maintenance from crawlers, shovels, and compressors—International power.

Partner Dennis Cote tells why they operate with four International crawlers plus four International diesels in shovels and an air compressor: "We standardized on International engines because of long, trouble-free life, minimum repairs, and unmatched work-ability. Our oldest UD-14 engine ran 8500 hours before being overhauled. Another UD-18 engine has worked 5500 hours with only one valve grinding job. All eight have plenty of power and good lugging ability."

Investigate the profit-protection you can get by specifying International power in your new machines or at repower time. Get full details on any of the eight outstanding International diesels from your nearby International Power Unit Distributor or Dealer.. who also provides the finest parts and service support available anywhere on heavy-duty power.

International® Construction Equipment

International Harvester Co., 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors... Self-Propelled Scrapers... Crawler and Rubber-Tired Loaders... Off-Highway Haulers... Diesel and Carbureted Engines... Motor Trucks... Farm Tractors and Equipment.

For more facts, use Request Card at page 18 and circle No. 254

Full compartmentation for the storage of surveying instruments, equipment, and supplies is the main feature of the Series P-A utility body. The unit's roof is insulated with Fiberglas and Masonite lining, and the front of the body features an adjustable ventilator.

Offer utility truck body for surveying parties

A utility truck body designed specifically for surveying parties is available from the Utility Body Co.

Called the Series P-A surveyor body, the unit includes full compartmentation for the storage of surveying instruments, equipment, and supplies. Long shelves for rods and tripods are lined with Masonite, with other shelves lined with plywood or rubber as desired.

Three aluminum sash windows on each side furnish good visibility, and a typical interior includes up to four adjustable bucket seats.

For further information write to the Utility Body Co., Dept. C&E, 1530 Wood St., Oakland 7, Calif., or use the Request Card at page 18. Circle No. 115.

Telescopic mast raises 4,000 pounds to 22½ feet

Up to 4,000-pound loads can be raised 22½ feet with the new Kwik-Mix Hi-Lifter through use of a 3-piece telescopic boom. The new fork truck is designed to operate 12 months a year over practically all ground conditions.

The top maximum weight lift with the fork truck (to 10 feet and with a 24-inch load center) is 6,000 pounds. The fork mast is all-hydraulically controlled. In addition to allowing high lifts, the telescoping mast permits entrance into low headroom areas. The mast can be tilted 10 degrees forward or backward.

A combination of power steering, convenient placement of controls, 4-wheel drive, and large tires is responsible for good traction and easy movement, even over rough terrain, according to the manufacturer.

Top speed for long hauls or moving from job to job is 18 mph. The power unit is a 70-hp water-cooled gasoline engine. An automatic transmission

Mobil

DIGS OUT BREAKDOWN CAUSES!

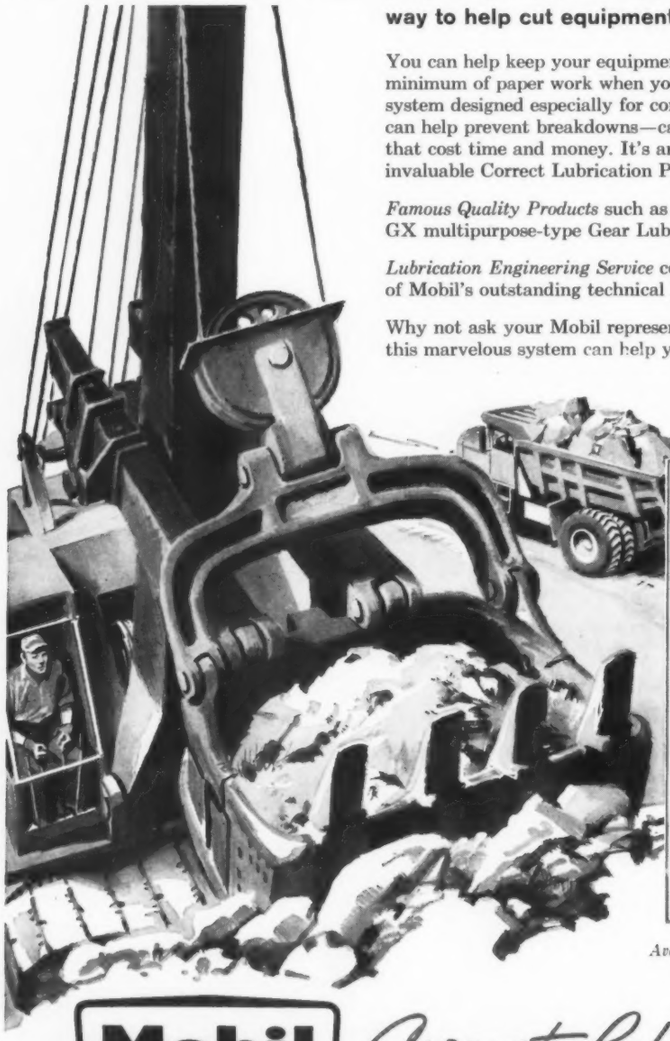
Use Mobil's Contractor PM System—the easy way to help cut equipment downtime . . . lost job time!

You can help keep your equipment in top working order with a minimum of paper work when you use Mobil's simplified PM system designed especially for contractors. This practical program can help prevent breakdowns—caused by improper lubrication—that cost time and money. It's an important step in Mobil's invaluable Correct Lubrication Program which also includes:

Famous Quality Products such as Delvac Oils, New Mobilube GX multipurpose-type Gear Lubricant and Mobilgrease.

Lubrication Engineering Service covering analysis, advice and use of Mobil's outstanding technical know-how.

Why not ask your Mobil representative to show you how this marvelous system can help you?



CONTRACTOR PM SYSTEM INCLUDES:

1. Record Folder—provides identifying data for each piece of equipment, holds equipment records.
2. Operator's Recommendation Chart—lists the correct lubrication recommendations for each piece of equipment.
3. Weekly Service & Inspection Report—an up-to-date record of mechanical condition of equipment, work to be done or completed.
4. Delivery Ticket—lists petroleum supplies delivered to equipment on the job.
5. "Squawk" Sheet—used by equipment operator to point out trouble spots that need attention.

Available—film on equipment safety, maintenance. Call nearest Socony Mobil office.

Mobil *Correct Lubrication*

Another reason you're Miles Ahead with Mobil!

SOCONY MOBIL OIL COMPANY, INC., and Affiliates: MAGNOLIA PETROLEUM COMPANY, GENERAL PETROLEUM CORPORATION

For more facts, use Request Card at page 18 and circle No. 255

DUDGEON HYDRAULIC JACKS

SALES RENTALS

CAPACITY TO 600 TONS

FOR:
- PILE TESTING
- UNDERPINNING
- BRIDGES
- PIPE PUSHING

Write to Dept. M

DESIGNERS and MANUFACTURERS OF

Hydraulic Units For Special Applications

RICHARD DUDGEON INC. EST. 1850

789 BERGEN STREET BROOKLYN, N. Y.

• ST 9-4040 •

For more facts, circle No. 256

The Hi-Lifter's telescopic boom permits lifts to 22½ feet.

provides smooth stop-and-go operation with three speed ranges forward and in reverse.

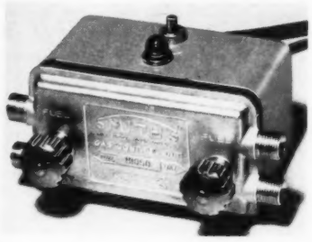
The Hi-Lifter is recommended for building contractors' use in placing bricks, stone, blocks, mortar, and other materials at upper levels, and for unloading and storing materials. In highway work, the machine is said to be ideal for handling forms, charging bins, and working around the batching yard.

For further information write to the Kwik-Mix Co., Division of the Koehring Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 11.

Control unit saves gas, time in welding, cutting

Savings in gas and time reportedly are achieved with the Smith Welding Equipment Corp.'s new gas-control unit, a push-button device that regulates the flow of oxygen and fuel gas in welding and cutting operations.

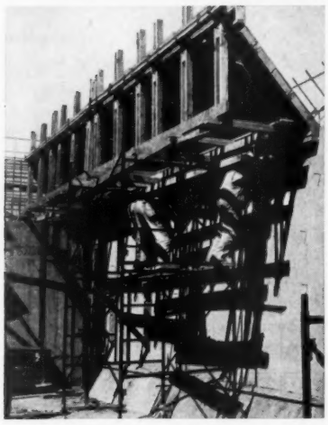
A touch of the button automatically switches flame settings from high to low, enabling the torch operator to obtain fast cutting starts, as well as rapid reduction in preheat flames to maintain and improve the cut once it is started.



The unit is said to perform equally well in hand or machine operations. It can be used with standard 3-hose cutting equipment, and with welding torches of medium or high-pressure types, without accessories. Hose connections are standard. The unit is solenoid-operated and plugs into any 110-volt outlet by means of a 10-foot heavy-duty cord.

For further information write to the Smith Welding Equipment Corp., Dept. C&E, 2633 Fourth St. S. E., Minneapolis 14, Minn., or use the Request Card at page 18. Circle No. 79.

Gang Forming Licks "Y" Wall Problem



Pays Off in Quality Pours, Speed and Reduced Costs

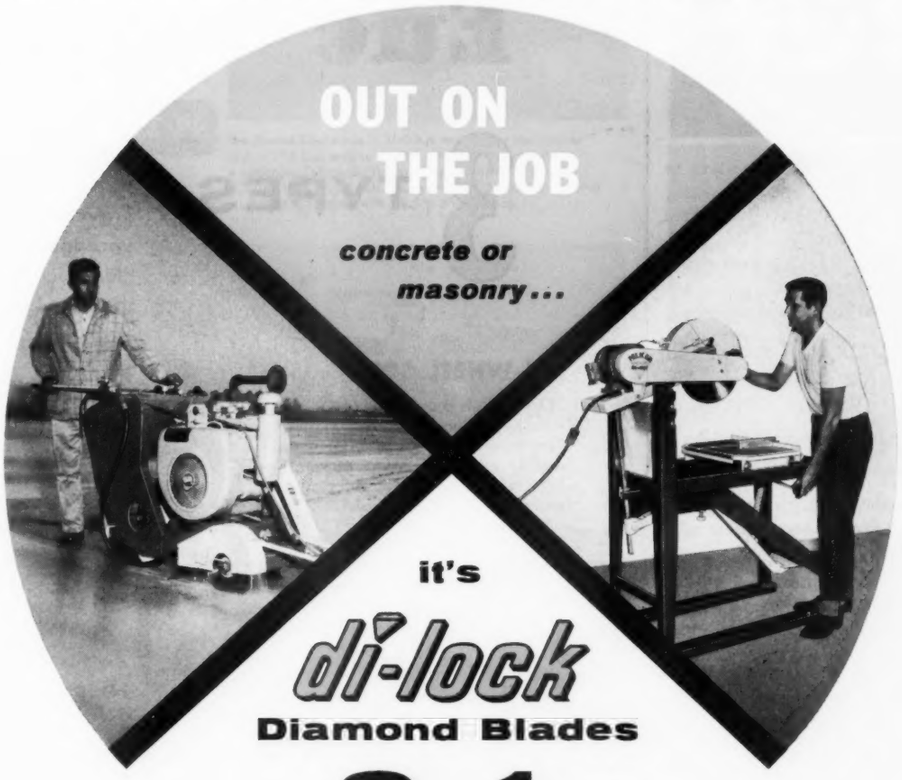
2,665 lineal feet of "Y" walls and half "Y" walls, with 16'9" high walls on tank addition to sewage treatment plant—that was the pouring problem faced by contractors, Wander & Mason of Worthington, Ohio. They solved the problem by pouring the walls in three lifts with the forms ganged for the final "Y" and half "Y" pours.

On the "Y" walls Symons panels, fillers and bay corners were ganged in 16-foot sections. One 16-foot outside section was stripped, moved to the next wall section and reset by three men in 20 minutes.

Symons Forms, Shores and Column Clamps can be rented with purchase option. Information on Symons products is available upon request. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. M-8, Chicago 39, Illinois.

MORE **SAVINGS** FROM **SYMONS**

For more facts, use Request Card at page 18 and circle No. 257



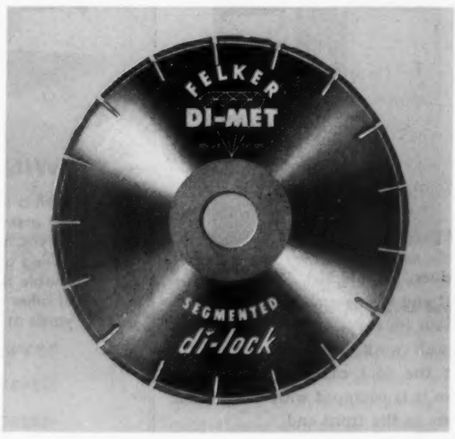
2 to 1

On test after test from one coast to the other, DI-LOCK stands out above all other diamond blades. Users report "LONGER LIFE"...as much as 78% more! "FASTER CUTTING"...speed that keeps ahead of every job requirement! "MUCH LOWER COST... based on actual number of cuts or footage produced against original blade cost!

Felker DI-LOCK insures the three essentials to blade economy—*longer life, faster cutting, lower cost per cut or per foot*—by the DI-LOCK method of diamond bonding...an exclusive process that seizes each diamond particle and locks it in the segment more tightly than ever before possible!

FOR MAXIMUM FOOTAGE AT LOW COST

buy the diamond blade whose results are confirmed by contractors...Volume users of Felker Di-Locks!



FELKER DI-MET SINCE 1924

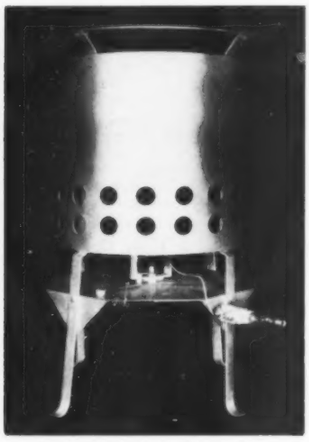
FELKER MANUFACTURING CO.
Torrance, California

For more facts, use Request Card at page 18 and circle No. 258

LP-gas-fired salamander offered in two models

An LP-gas-fired salamander, featuring a new type of burner and reflector, is offered by Weldit, Inc.

According to the company, the burner maintains high output regardless of a drop in tank pressure,



and the deflector offers more area to the heating flame, thus increasing output as it directs the heat where needed.

Available in high and low-pressure models, the salamander is designed for inside and outside operation. The low-pressure model is adjustable from 25,000 to 78,000 Btu's, and the high-pressure unit delivers more than 100,000 Btu's. A tank-top model is also available.

For further information write to Weldit, Inc., Dept. C&E, 990 Oakman Blvd., Detroit 38, Mich., or use the Request Card that is bound in at page 18. Circle No. 120.

New pavement breaker is light in weight

A new lightweight paving breaker is offered by the Worthington Corp. The 24-pound tool is reported to be ideal for light utility work, trimming around steelwork, and brick and blacktop removal.

Designed with a rubber buffer-type

retainer, the Model WB-24 has a front end with a smooth symmetrical contour for easy operator handling on sidewall work. The company states that the tool cannot overheat because it is equipped with exhaust air passes in the front end.

For further information write to the Worthington Corp., Dept. C&E, 37 Appleton St., Holyoke, Mass., or use the Request Card at page 18. Circle No. 32.

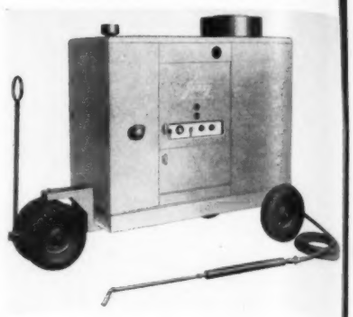
Steam-hydraulic cleaner for heavy equipment

A steam-hydraulic cleaner called the 3500 Series Hypressure Jenny is offered by the Homestead Valve Mfg. Co.

According to the company, instant choice of eleven different cleaning actions is made possible by the movement of a single lever. A 360-gph pump delivers only the amount required for any specific job. Outlet pressures and temperatures are varied by the operator up to 300 pounds and up to 325 degrees F.

The cleaner comes in trailer-mounted, shop portable, or stationary models, with a choice of oil or gas for fuel. The shop portable model measures 81½ inches long, 40½ inches wide, 59 inches high and weighs approximately 1,180 pounds.

For further information write to the Hypressure Jenny Division, Homestead Valve Mfg. Co., Dept. C&E, P. O. Box 550, Coraopolis, Pa., or use the Request Card at page 18. Circle No. 84.



◄

"Euc" scrapers match any size

3 TYPES

Euclid offers you the most complete line of self-powered scrapers in the industry—and they're all job-proved to give you more work-ability and low cost yardage. No matter what your job may be—from small clean-up or grading work to big yardage projects—there's a size and type that meets your requirements

SIX-WHEEL SCRAPERS

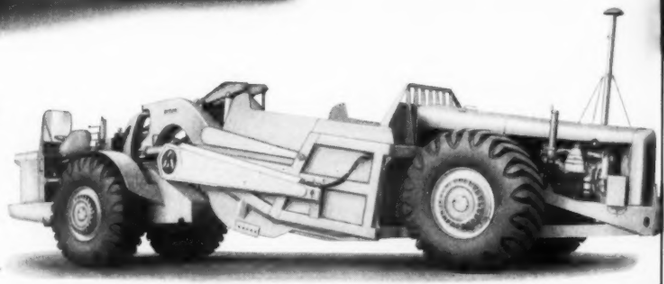
These models provide maximum stability for long, high speed hauls. They have capacities of 12, 18, and 24 yds. struck . . . are powered by engines of 218 to 335 h.p. and haul heaped loads of 16, 25 and 32 yds. at speeds up to 30 mph. These scraper bowls are interchangeable with bottom-dumps of 13, 17 and 25 yd. capacities.

OVER-HUNG ENGINE MODELS

Payload capacities of these "Eucs" are 7, 12 and 21 yds. struck . . . 9, 17 and 30 yds. heaped. Over-hung engine design of tractors provides excellent maneuverability and ease of handling in difficult work . . . engines are 143, 218 and 325 h.p. Rear-Dump trailers of 12, 22 and 35 ton capacities are interchangeable with the scrapers.

TWIN-POWER SCRAPER

With a total of 518 h.p., this Euclid has a struck capacity of 24 yds. . . . 32 yds. heaped. Two engines, each having a separate Torqmatic Drive, enable this "Euc" to work independent of other equipment and move more yards at lowest cost on any scraper job.



Your Euclid dealer can supply performance and cost data on the Euclid Scrapers best suited to your operations. Have him show you why Euclids give you the best return on investment

GM GENERAL MOTORS EUCLID

EUCLID EQUIPMENT

FOR MOVING EARTH, ROCK, COAL AND ORE

Vibrating compactors now trailer-mounted

Jackson Vibrators, Inc., offers its vibratory pan-type compactor mounted on a trailer that can be pushed or pulled by any prime mover capable of speeds as low as 50 fpm. Remote control permits the operator to raise and lower the workhead. New-type bases permit operation in either direction and eliminate the need for turning around or deadheading.

The workhead may consist of 3, 4, 5, or 6 vibratory units, or two workheads of up to four units each in tandem may be used. Each vibratory unit has its own motor, develops 6,000 pounds of force at 4,200 rpm, and may be detached and used individually for compacting in confined areas. Each unit produces both single and 3-phase 110 to 150-volt, 60 to 80-cycle ac.

For further information write to Jackson Vibrators, Inc., Dept. C&E, Ludington, Mich., or use the Request Card at page 18. Circle No. 112.

On the Jackson trailer-mounted compactors, remote control permits the operator to raise and lower the workhead. Each vibratory unit has its own motor and develops 6,000 pounds of force at 4,200 rpm.

...nysize or kind of job

7 MODELS

job proved for high production

TS-24

The Model TS-24 has a 300 h.p. engine for the tractor and a 218 h.p. engine for the scraper... each with a separate Torqmatic Drive. Heaped capacity at 1:1 is 32 cu. yds.... 24 yds. struck. Full 90° hydraulic steering ... 27.00 x 33 tires with 33.5 x 33 optional.

SS-12

This 4-wheel tractor model has a struck capacity of 12 cu. yds.... 17 yds. heaped ... with 218 h.p. engine and 5-speed transmission. Tire sizes are 12.00 x 25 front and 21.00 x 25 on drive and scraper wheels with 24.00 x 25 optional.

S-7

Model S-7 is equipped with 143 h.p. engine ... 18.00 x 25 tires ... 4-speed Torqmatic Drive ... full hydraulic 90° steering. Capacity is 7 cu. yds. struck and 9 yds. heaped at 1:1 slope. Optional tires are 21.00 x 25.

SS-18

The Model SS-18 has a 300 or 320 h.p. engine and 3-speed Torqmatic Drive or a standard 10-speed transmission. Capacity is 18 cu. yds. struck and 25 yds. heaped. Drive and scraper tires are 24.00 x 25 with 29.5 x 25 optional... hydraulic booster steering.

S-12

Powered by a 218 h.p. engine, the Euclid S-12 Scraper has a 5-speed transmission ... 24.00 x 25 tires ... full hydraulic 90° steering. Struck capacity is 12 cu.yds..... at 1:1 heap, 17 yds.

SS-24

A 325 or 335 h.p. engine with Allison 4-speed transmission and converter lock-up powers the Model SS-24. Struck capacity is 24 cu. yds.... 32 yds. heaped. Drive and scraper tires are 27.00 x 33 with 33.5 x 33 optional for maximum traction and flotation.

S-18

This Model S-18 has a 325 h.p. engine with 4-speed Torqmatic Drive and converter lock-up. Struck capacity is 21 cu. yds.... 30 yds. at 1:1 heap. Tires are 27.00 x 33 with 33.5 x 33 optional ... full hydraulic 90° steering.

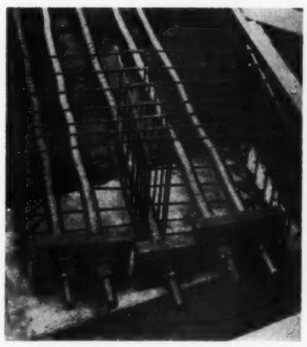
"Euc" Scrapers have hydraulic lever action, 4 section adjustable and reversible cutting edges, unequalled accessibility for servicing and other cost-cutting advantages. Check job performance and return on investment before you decide on any scraper equipment.

EUCLID
Division of General Motors Corporation
Cleveland 17, Ohio

Pliable tubing forms ducts in prestressed members

Pliable steel tubing for forming ducts in prestressed concrete and installing service ducts in concrete and concrete piles is announced by the Kopex Division of the Gemmer Mfg. Co.

Installation reportedly requires neither special equipment nor specially skilled men. The tubing is easily bent



without distortion of bore and can be laid in concrete in a continuous length. Exterior ribbing assures perfect bond with the concrete bed, and the smooth interior bore offers minimum resistance to cables and bars and allows free flow of grout.

Kopex tubing is available from ⅝-inch ID to 4-inch ID in drum, coil form, or straight lengths. It can be cut by hand to any desired length.

For further information write to the Kopex Division of the Gemmer Mfg. Co., Dept. C&E, 6400 Mt. Elliott Ave., Detroit, Mich., or use the Request Card at page 18. Circle No. 119.

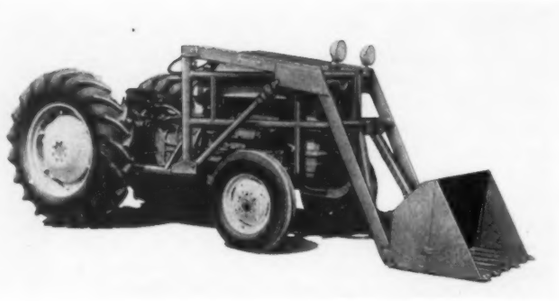
New truck series offer five basic models each

Two newly designed series—C-200 and C-300—have been added to the Reo line, and each offers a total of five basic models.

Featuring 15,000 to 17,000-pound-capacity rear axles, the trucks are in the 18,500 to 23,000-pound-gvw class.

Chassis features include Ross steering and long front springs for smooth riding. A choice of single-reduction, double-reduction, or 2-speed axles is available, as are five Gold Comet 6-cylinder engines.

For further information write to the Reo Division, The White Motor Co., Dept. C&E, Washington Ave., Lansing 20, Mich., or use the Request Card at page 18. Circle No. 90.



Initial installation time for the Freeman loader is about two hours; after this, the unit can be removed from the tractor in 15 minutes and re-installed in less than one hour. Rear wheels need not be removed.

Hydraulic bucket control featured on new loader

A front-end loader offering hydraulic bucket control for Ford, International, and Massey-Ferguson tractors is announced by the Freeman Loader Corp.

One new feature is the C-2-44 valve and manifold plate, for use on late model Ford and Massey-Ferguson tractors, that can be used to operate the loader or other hydraulic tools, disk harrows, mowers, wagon hoists, and others. The valve has two spools, which permit the use of two sets of hydraulic cylinders, either single or double acting, to be operated independent of each other from the tractor's own hydraulic system.

The main frame of the loader is made in two pieces for easy mounting, and loader arms are 1×4-inch solid high-carbon steel. Capacity is over 2,000 pounds, and lifting height to bottom of bucket is 10 feet 8 inches.

For further information write to the Freeman Loader Corp., Dept. C&E, Blair Pike Road, Peru, Ind., or use the Request Card at page 18. Circle No. 94.

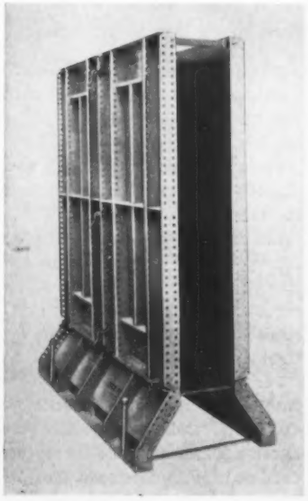
Announce new all-steel spread-footing forms

Designed to permit concrete footings and foundation walls to be poured at the same time, a new type of spread-footing form is announced by the Economy Forms Corp.

These all-steel units are made for use with regular Efco form equipment. Standard height of the forms is 10 inches; height of footings cast is 8 inches. The forms are produced in lengths of 96, 48, 24, and 12 inches.

Spread corner forms for inside and outside are also available.

For further information write to the Economy Forms Corp., Dept. C&E, Box 128-E, Highland Park Station, Des Moines, Iowa, or use the card at page 18. Circle No. 51.



Offer mulch tiller for roadside work

A balanced-weight mulch tiller designed for use on highway shoulders, embankments, levees, and watersheds is available from the Independent Mfg. Co., Inc.

According to the company, the tiller provides an efficient way of anchoring straw or other mulch in the soil surface after seeding. Built on a low line of gravity, the unit is said to work on the steepest inclines.

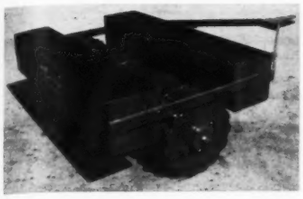
Nine ¼-inch×20-inch blades make

Jack Hartrick (left) and Chuck Daub (right) go over lubrication and fuel deliveries with W. D. Dillon, one of the joint venture project principals. Chuck Daub is a Standard lubrication engineer. Like Hartrick, Daub has an engineering degree plus special training for this work.

STANDARD OIL service helped this contractor on the Illinois Toll Highway

McCarthy-Mass-Dillon learn about Standard Oil service while building an $11-million segment of the Illinois Toll Highway

John Peters, purchasing agent and office manager, goes over order for supplies with Jack Hartrick. In addition to experience and training for working with contractors on jobs like this, Jack has completed the Standard Oil Sales Engineering School.



up the tilling tool. Spaced 8 inches apart, the blades are made of heat-treated high-carbon steel. Scrapers mounted on an angle bar clean the blades.

Sand or gravel is added to ballast boxes mounted ahead of and behind the tilling blades. The unit is 6 feet wide and weighs 1,000 pounds. Rubber mounting is available as an extra feature.

For further information write to the Independent Mfg. Co., Inc., Dept. C&E, Box 208, Neodesha, Kans., or use the Request Card at page 18. Circle No. 28.

For further information on any product described in this section, circle the indicated number on the Request Card at page 18.

This Euclid tractor is powered by a 218-hp diesel and is equipped with a 5-speed transmission. Full hydraulic steering permits a 90-degree turn.

Rear-dump hauls 22 tons at top speed of 22.6 mph

A new rear-dump with a payload capacity of 22 tons is announced by the Euclid Division of General Motors Corp.

The Model S-12 consists of an overhung engine-type tractor with an Easton - built variable - wheel - base semitrailer. The tractor is powered by a 218-hp diesel and is equipped with a 5-speed transmission. Top speed with full payload is 22.6 mph. Tractor and trailer tires are 24.00 × 25, 24-ply, and are interchangeable.

Full hydraulic steering enables the tractor to make a full 90-degree turn, and the complete unit reportedly can make a nonstop turn in just a little more than its 28-foot 8-inch length. In dumping position, the wheel base is shortened by 5½ feet, thus permitting a turning width of only 24 feet.

For further information write to the Euclid Division, General Motors Corp., Dept. C&E, 1361 Chardon Road, Cleveland 17, Ohio, or use the Request Card that is bound in at page 18. Circle No. 108.

Easy setup a feature of new concrete plant

The Model 275 concrete batch plant, said to disassemble into three mobile units, has been announced by the C. S. Johnson Co.

According to the company, three alternate bin sizes give a wide range of capacities while handling four aggregate sizes. The three bin sizes offered have 33, 50, and 67-cubic-yard capacities. A pivoted distributor is manually controlled from ground level or may be equipped for remote control. Maximum erection lift is 7½ tons.

A 3½-cubic-yard concentric batcher has standard manual aggregate control with semiautomatic cement control. Automatic controls are available. The plant is equipped with Johnson beam-type scales.

A live-storage shelf and a spout to the batcher are features of the plant's 350-barrel-capacity Porto-Silo. The cement elevator is powered by a 7½-hp motor. Working with a screw conveyor with undertrack attachment, or 30-inch-square hopper, it can handle 180 barrels of cement per hour.

For further information write to the C. S. Johnson Co., Subsidiary of Koehring Co., Dept. C&E, Box 71, Champaign, Ill., or use the Request Card that is bound in at page 18. Circle No. 59.

When McCarthy-Mass-Dillon was awarded the contract for 17.2 miles of the Illinois Tollway west of the Fox River, they contracted with Standard Oil for petroleum products. Here's what happened:

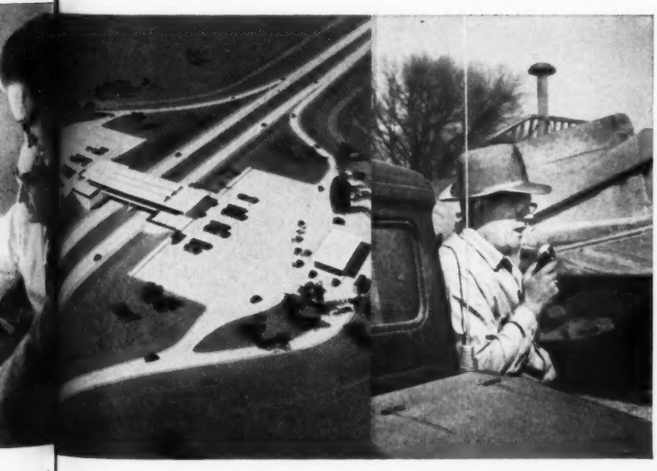
1. Jack Hartrick, a Standard Oil lubrication specialist with a degree in engineering and 11 years' selling experience with Standard, was assigned to the project. He surveyed equipment and recommended lubricating oils, greases and fuels.

2. Products able to provide lubrication over a wide range of applications plus competent recommendations by a man trained for this work resulted in the contractor having to maintain only a minimum investment in inventories. Storage and application facilities were likewise kept to a minimum.

3. Motor oil, diesel fuel and gasoline were delivered to the site from supply stations at Huntley and Rochelle, each of which is only a few miles away.

Both facilities were on call 24 hours a day. Equipment was never idle for lack of supplies of petroleum products.

This kind of service added up to money saved for the contractor. You can get this kind of service on your construction job anywhere in the 15 Midwest and Rocky Mountain states serviced by Standard. Find out how. Call the Standard Oil office nearest you. Or write **Standard Oil Company (Indiana), 910 S. Michigan Ave., Chicago 80, Ill.**



Model of Standard Oil service plaza on Illinois Tollway. Five such units will provide service from both sides of the highway. Air conditioned, over-the-roadway restaurant will give guests an interesting view of the Tollway.

Getting the message. Howard Leonard talks to headquarters from site of Tollway interchange with Highway 31. Leonard supervises more than 150 pieces of equipment on the job—all of it lubricated by Standard Oil products.

Two motor oils, three greases and two fuels make up most of the inventory of petroleum products on the McCarthy-Mass-Dillon job. Here's the list:

STANOLUBE HD-M Motor Oil
STANOLUBE Series 3 Motor Oil
RYKON Grease
AMOCO Lithium Multi-Purpose Grease
CALUMET Viscous Lubricant
STANOLIND Diesel Fuel
STANDARD RED CROWN Gasoline

STANDARD Asphalt is used by the contractor on all shoulder construction.

You expect more from **STANDARD** *and get it!*

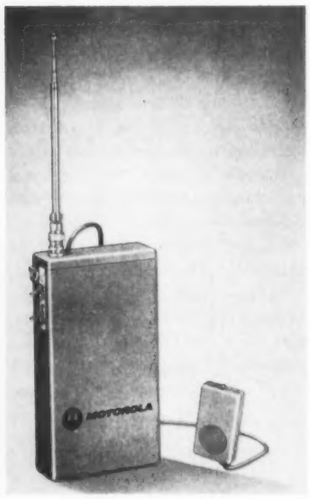
←For more facts, circle No. 260

Two-way radio unit for the man on foot

Extension of 2-way field radio service to the construction man on foot, such as the superintendent who leaves his pickup to inspect an operation, is announced by Motorola with introduction of the new Handie-Talkie pocket receiver and accompanying pocket transmitter.

The fully transistorized receiver picks up all radio signals on a system's frequency, making possible the immediate contact of key personnel on construction projects. Communications can be maintained with the system's base station or any of its mobile stations.

The 46-ounce Handie-Talkie transmitter measures approximately 8× 4×1½ inches. It provides a full 1¼-watt radio frequency output in the 25 to 54-megacycle band and 1.0 watt in the 144 to 174-megacycle band. It can easily be carried on a man's belt.



The entire receiver weighs only 10½ to 12 ounces, depending on the type of battery used. It measures less than 6 inches long, 2½ inches wide, and 1⅛ inches deep. The Handie-Talkie receiver clips onto a belt or fits easily into a pocket.

For further information write to Motorola, Inc., Dept. C&E, 4501 W. Augusta Blvd., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 38.

New leveling rod is easier to read

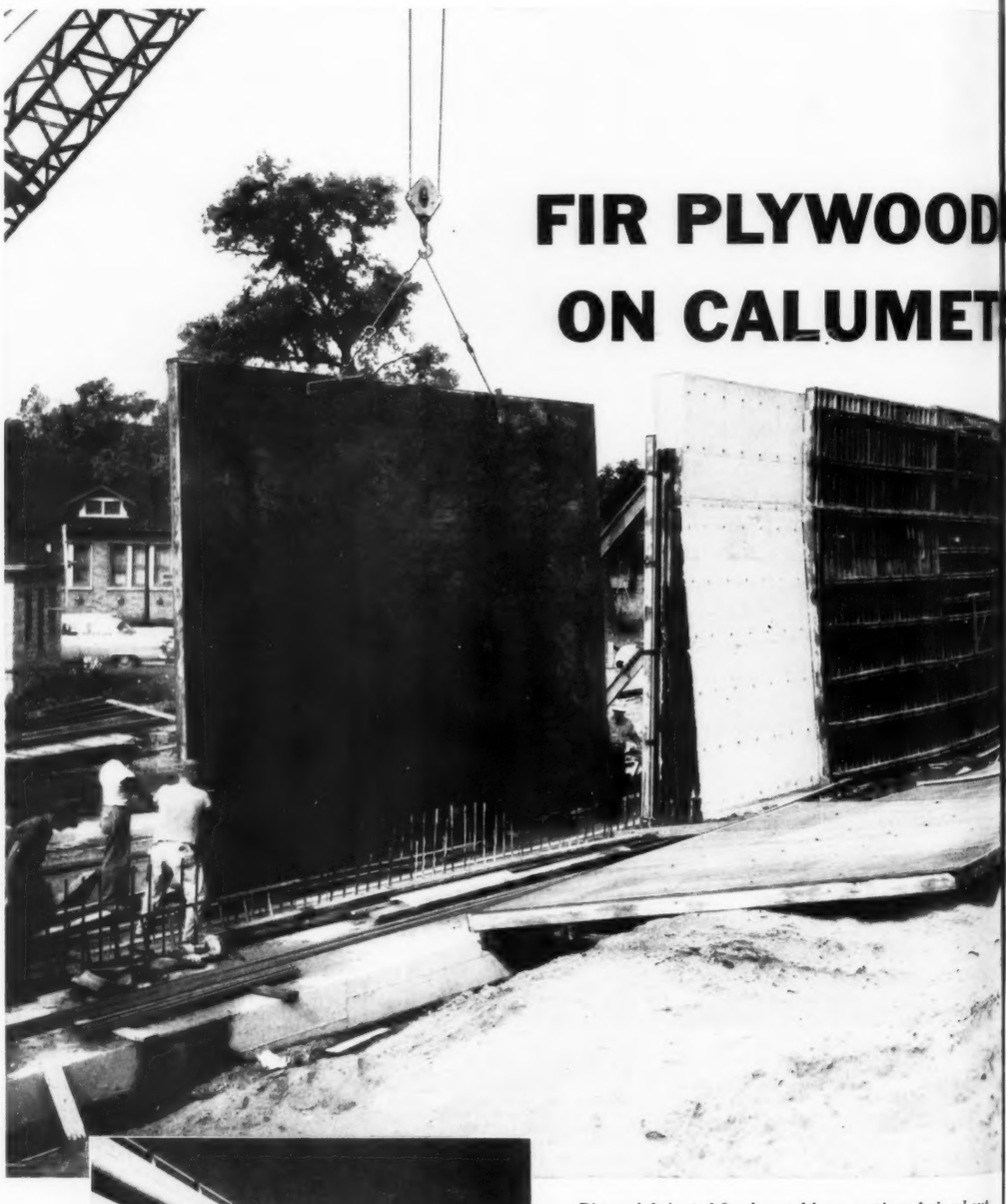
An improved 3-section Detroit leveling rod that features easy reading at longer distances than previous methods allowed is announced by the Keuffel & Esser Co.

According to the company, the unit is quick to operate, completely rigid, and easily portable.

The rod can be used in lengths of 4, 8, or 12½ feet. Its three sections are carried in a partitioned, mildew-resistant bag 4½ feet long.

For further information write to the Keuffel & Esser Co., Dept. C&E, Adams and Third Sts., Hoboken, N. J., or use the Request Card at page 18. Circle No. 16.

Weighing less than 1,000 pounds, this crane is capable of lifting up to 1½ tons. Known as the Fococrane, the fully hydraulic unit fits in a space 12 inches wide between the cab and the bed of the truck, and swings out of the way when not in use. It is designed to fit all trucks and is very simple to operate. To avoid placing damaging stress on the frame and springs of the truck, the crane is provided with a self-adjusting hydraulic support leg, lowered and raised by one touch of the control lever. The Fococrane has a swing angle of 270 degrees, and a lift of 19½ feet. For further information write to the **McCullough Crane & Hoist Co.**, Dept. C&E, 3124 E. 14th St., Oakland 1, Calif., or use the Request Card at page 18. Circle No. 98.



Big prefabricated fir plywood form sections helped cut costs, speed work on 8-mile long Calumet Skyway.

CALUMET SKYWAY TOLL BRIDGE LOCATION:
West end of Indiana Toll Road to downtown Chicago

COORDINATING ENGINEERS:
De Leuw Cather & Company

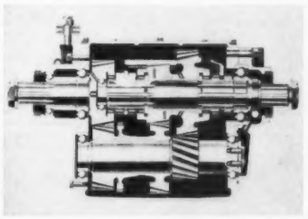
CONTRACTORS FOR FORMWORK:
R. R. Anderson Co., Chicago
Arcole Midwest Corp., Skokie, Ill.
M. J. Boyle & Co., Chicago
J. M. Corbett Co., Chicago
Kenny Construction Co., Skokie, Ill.

An inch-by-inch profile of the surface of a road, airstrip, or pavement area, in permanently recorded form, is made possible with Soiltest's Model CT-444 road-roughness indicator. The unit consists of a test trailer, ramp, electronic controls and recording unit, and a specially modified panel-instrument truck. The trailer is towed by the truck at a constant speed (usually 20 mph). Variations in the pavement profile cause the test tire to move up and down, and this movement is converted into electronic impulses, which are relayed to the instrument panel in the truck. The data is recorded to provide a roughness index in terms of inches per mile. At the same time, an oscillograph plots a permanent record of the pavement profile. For further information write to **Soiltest, Inc.**, Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 107.

Gear-ratio sets augment line of transmissions

The Fuller Mfg. Co. has announced expansion of its line of 3-speed auxiliary transmissions to include a total of 16 units.

The addition of nine new sets of gear ratios now makes it possible for the company to offer a complete line of 3-speed auxiliaries. Designed for use in the heavy-construction and allied industries, the new transmissions are said to provide the widest range of gearing options at lower prices than competitive units.



The Fuller 92 Series 3-speed auxiliary transmission.

The expanded line of auxiliaries includes splitting ratios, both underdrive and overdrive, which permit engines to operate at maximum horsepower through a full range of vehicle speeds.

The new heavy-duty 92 Series (for engines up to 920-cubic-inch piston displacement) has been augmented by five new sets of gear ratios, Models 3-D-92 through 3-H-92. Four new sets of gear ratios, designated Models 3-E-65 through 3-H-65, have been added to the medium-heavy-duty 65 Series. Ratios vary from .74:1 to direct drive in the high ratios and from 1.239:1 to 2.64:1 in the low ratios.

For further information write to the Fuller Mfg. Co., Dept. C&E, Kalamazoo, Mich., or use the Request Card at page 18. Circle No. 14.

New ammonium nitrate offered for blasting

The Spencer Chemical Co. announces a new type of ammonium nitrate said to eliminate the need for dynamite in field-compounded explosives.

Designated N-IV, the nitrate is basically an uncoated material with a special surface treatment said to eliminate caking and improve prill structure. It is packaged in a heavy-wall polyethylene plastic bag.

The company points out that the elimination of inert coating ingredients increases the blast sensitivity of an ammonium nitrate-fuel oil mixture to the point where it can be detonated by 3/8-inch detonating cord instead of dynamite. In addition, the N-IV material minus the inert ingredients, usually 2 to 4 per cent of the total, is 100 per cent ammonium nitrate by weight.

For further information write to the Spencer Chemical Co., Dept. C&E, Dwight Bldg., Kansas City 5, Mo., or use the Request Card at page 18. Circle No. 99.

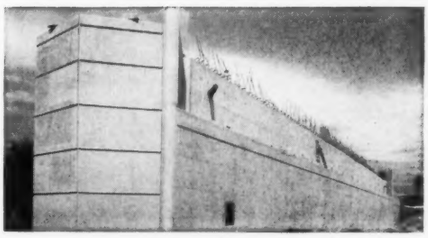
ODFORMS SPEED CONCRETING ETSKYWAY TOLL BRIDGE

GIANT FIR PLYWOOD FORM SECTIONS, as large as 28′ x 31′, played an important role in keeping work moving at a near record clip on the new eight-mile long Calumet Skyway which links the Chicago business district with the Indiana toll road.

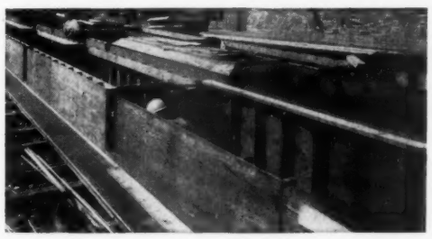
The job features one of the world's longest retaining walls along three of the eight miles. Over 30 feet tall in places, the wall was formed by leap-frogging the big prefabricated plywood form sections. In most instances, forms were built to maximum wall height and simply cut down for shorter walls. Plywood forms were also used for abutments at street crossings and for beams and bridge decks on overpasses.

Plywood was called for in the job specifications for uniformly smooth concrete, but contractors on the job credit plywood's ease of fabrication and handling—coupled with a high number of re-uses (up to 15 or 20 pours)—with holding down costs as well.

All told, over 300,000 square feet of plywood forms were used by the five contractors concerned with pouring walls, abutments and decks.



Rustication lines on walls and abutments were achieved by nailing strips to face of plywood forms.



Fir plywood was also used for forming reinforced concrete beams and deck slabs on entrance ramps.

DOUGLAS FIR PLYWOOD ASSOCIATION
TACOMA 2, WASHINGTON
A non-profit industry organization devoted to research, promotion and quality control

DFPA TESTED QUALITY

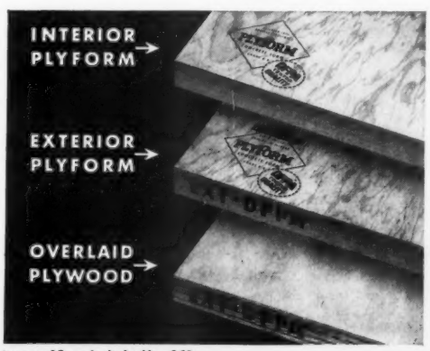
ALWAYS SPECIFY BY DFPA GRADE-TRADEMARKS

Letters DFPA indicate material has been inspected and tested under rigid DFPA-Industry quality control program. Grades manufactured expressly for concrete form work include:

INTERIOR PLYFORM®—standard concrete form grade plywood made with moisture-resistant glue. Gives multiple (10-12) re-uses.

EXTERIOR PLYFORM®—standard concrete form grade plywood made with waterproof glue to give as many as 25 or more re-uses.

OVERLAID PLYWOOD—special panel with hard, glossy, plastic-like fused resin fiber surfaces. Forms smoothest concrete; up to 200 re-uses.



For more facts, use Request Card at page 18 and circle No. 261

NEW! NEW! NEW!
ATTENTION: Contractors, City Engineers, Councilmen
IS THAT NEW BOND ISSUE NECESSARY?

- Would you like to make the taxpayers' concrete pipe dollar go 20 to 30% further?
- Contractors! Are you having joint problems?
- Extrude perfectly bedded No-Joint Concrete Pipe and show bigger profits.
- Save the taxpayers' dollars with portable No-Joint equipment in sizes from 24" to 72" pipe.
- No-Joint Concrete Pipe with over 800,000 feet in place has never had a load failure in seven years of service, in all kinds of soil conditions.
- For storm sewers, down city streets, under highways, for sanitary sewers and irrigation projects.
- A completely new conception of concrete pipe that you must see to appreciate! !

OUR PIPE WILL DO THE JOB—WILL YOU? ? ?

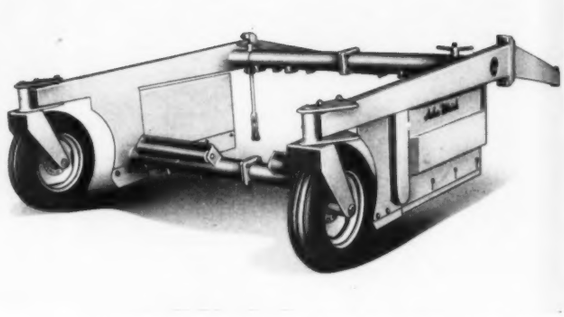
SAVE! SAVE!! SAVE!!!

NO-JOINT Machine making 48" storm drain

Write today for full details to:

NO-JOINT CONCRETE PIPE CO., P.O. Box 609, YUBA CITY CALIFORNIA

For more facts, use Request Card at page 18 and circle No. 262



Attaching in minutes to any Caterpillar D8, D7, or D6 track-type tractor, the Ulrich U-100 base spreader is secured to any width dozer blade by wing-nut clamps. Fast and accurate spreading in lifts from 1 to 20 inches is claimed.

Base spreader offered for crawler tractors

The John J. Ulrich Co. announces the Model U-100 base spreader.

The unit reportedly attaches in minutes to any Caterpillar D8, D7, or D6 track-type tractor. Push-fork arms slip onto the trunnions and are secured by one bolt on each side. The dozer blade serves as the strike-off.

According to the company, fast, accurate spreading in lifts from 1 to 20 inches is assured. Angle push-fork arms provide maximum blade lift assuring full depth of spread, and the width of spreads can be varied from 8 to 16 feet. Full-depth doors control spread width, permitting even material flow without spillage. Replaceable 8-inch strike-off blades adjust to control the edge of spread material.

For further information write to the John J. Ulrich Co., Dept. C&E, El Paso, Ill., or use the Request Card at page 18. Circle No. 83.

File designed for plans that cannot be folded

For those plans, tracings, maps, and blueprints that cannot be folded, the Ross-Martin Co. offers the all-steel Flatfile.

The four-shelf unit takes sizes up to 33×42 inches, and has a lock-equipped disappearing door to give unhampered access.

The file is designed to stack in multiples to conserve space. Its desk-high leg base places a single section at easy working height.

For further information write to the Ross-Martin Co., Dept. C&E, P. O. Box 800, Tulsa 1, Okla., or use the Request Card at page 18. Circle No. 116.

TOUGH JOBS?

you can't beat a GRADE-O-MATIC

- Automatic multiplication of torque.
- Automatic application of power.
- Automatic regulation of speed.
- Correct balance of weight and power.
- More "push-power" at the blade.

All of which assures moving more dirt in faster work cycles.

Write for literature.

THE GALION IRON WORKS & MFG. CO.
General and Export Offices, Galion, Ohio, U.S.A.

GALION ESTABLISHED 1907

MOTOR GRADERS & ROLLERS

For more facts, use Request Card at page 18 and circle No. 263

One of the two new models offered, FWD's C6-547 ready-mix-concrete truck features an 18,000-pound front axle and rear tandem axles rated at 36,000 pounds combined.

New transit mixers offered in two models

Two new ready-mix-concrete trucks designed to meet special area weight restrictions are announced by the Four Wheel Drive Auto Co.

The Model C6-547 is a 54,000-pound gvw truck with an 18,000-pound front axle and rear tandem axles rated at 36,000 pounds. The truck is designed to carry maximum legal loads in areas which permit upwards of 49,000 pounds gvw on a 3-axle truck but where weight on the two rear axles combined is limited to 32,000 pounds.

Available with either conventional or tilt-type cab, the C6-547 is equipped with an RD-501 6-cylinder valve-in-head 212-hp gasoline engine.

The Model C6-405 is designed to carry maximum legal loads in areas where the legal gvw is limited to 42,000 to 44,000 pounds, and where 32,000-pound loads on the tandem rear axles are permitted. Equipped with a 5-cubic-yard mixer, the C6-405 reportedly will scale legally with 5 to 5½-cubic-yard loads in such areas.

The power plant in the C6-405 is an RD-406 6-cylinder valve-in-head 175-hp gasoline engine.

Both trucks have 5-speed transmissions and 2-speed transfer cases, giving them 10 forward speeds and 2 reverse.

For further information write to the Four Wheel Drive Auto Co., Dept. C&E, Clintonville, Wis., or use the Request Card at Page 18. Circle No. 85.

Horizontal shoring beam has telescopic design

The American Pecco Corp. announces a new telescopic-type horizontal shoring beam.

Light and sturdy, the Pecco-Beam is designed to support slab forms for all types of concrete-slab construction.

The Pecco-Beam is available in three basic units, which are adjustable to spans from 8 feet 6 inches to 27 feet 7 inches, and can carry weights up to 6,600 pounds.

For further information write to American Pecco Corp., Dept. C&E, 188 E. Post Road, White Plains, N. Y., or use the Request Card at page 18. Circle No. 117.

WINSLOW—PORTABLE TRUCK SCALE

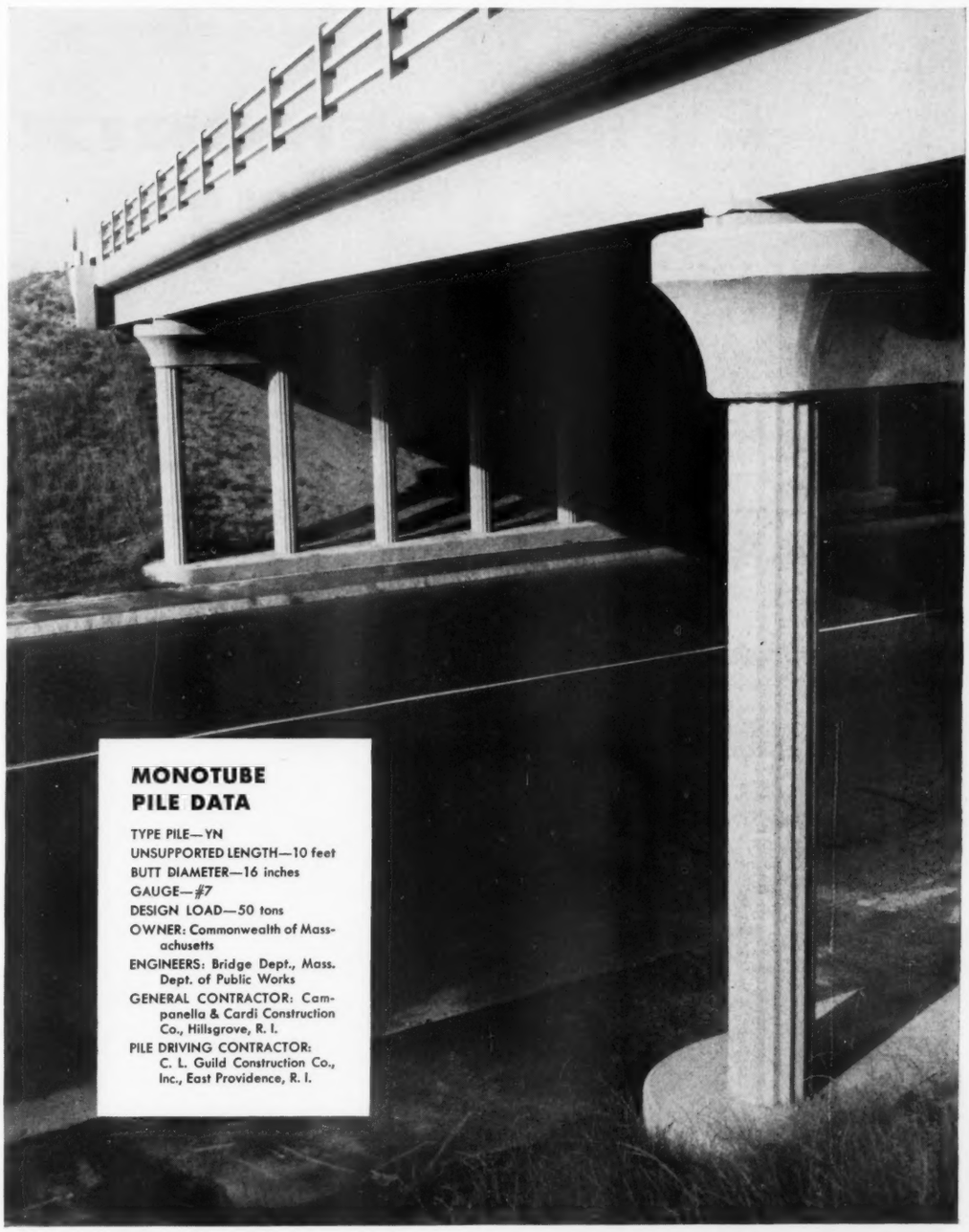
THE CONTRACTORS' SPECIAL SCALE

For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacity: 15-18-20-30, 40 and 50 tons.

Write us for name of your nearest distributor

WINSLOW SCALE COMPANY P.O. Box 1198 Terre Haute, Indiana

For more facts, use Request Card at page 18 and circle No. 264


MONOTUBE
PILE DATA
TYPE PILE—YN
UNSUPPORTED LENGTH—10 feet
BUTT DIAMETER—16 inches
GAUGE—#7
DESIGN LOAD—50 tons
OWNER: Commonwealth of Massachusetts
ENGINEERS: Bridge Dept., Mass. Dept. of Public Works
GENERAL CONTRACTOR: Campanella & Cardi Construction Co., Hillsgrove, R. I.
PILE DRIVING CONTRACTOR: C. L. Guild Construction Co., Inc., East Providence, R. I.

STRENGTH *plus* VERSATILITY with Monotube piles . . . a perfect combination for this bridge on the Mid-Cape Highway, Dennis, Mass. *Acting as columns*, as well as foundations, Monotube steel piles provide necessary strength, eliminate column form-work and add to architectural beauty.

Tapered, fluted Monotube piles are available in lengths, diameters and gauges to meet every requirement. Write The Union Metal Manufacturing Co., Canton 5, Ohio, for complete information.

UNION METAL
Monotube Foundation Piles

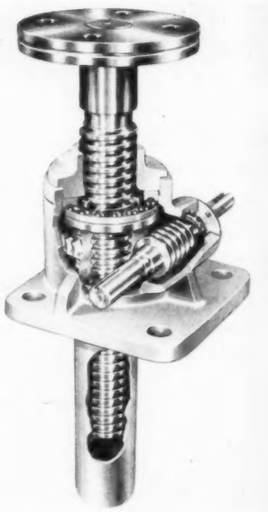
For more facts, use Request Card at page 18 and circle No. 265

To mechanize the loading of fertilizer-grade ammonium nitrate, the Atlas Powder Co. offers the Jetloder, a new blow loading machine that uses compressed air to blow the blasting agent, and also sand stemming, into blast holes. The machine reportedly can blow 2½ pounds per second of ammonium nitrate and diesel oil mixture into a 50 to 60-foot horizontal blast hole. The only basic equipment required for use with the Jetloder includes a compressor to provide air at 45 psi; a truck or other device to move the compressor and blow loading machine and supplies; a sufficient amount of 1½-inch ID plastic pipe to reach from the machine to the back of the blast holes. For further information write to the **Atlas Powder Co.,** Dept. C&E, Concord Pike and New Murphy Road, Wilmington 99, Del., or use the Request Card at page 18. Circle No. 106.

New worm-gear jacks lift up to 100 tons

The Duff-Norton Co. offers a new line of worm-gear jacks in capacities of 2, 5, 10, 15, 20, 25, 50, and 100 tons.

Known as the 1800 Series, the jacks are mechanical devices, will



hold heavy loads in position indefinitely without creep, and require no adjustment.

All eight models have a uniform rate of raise that permits jacks of varying capacities to be operated in unison on unevenly distributed loads. Raises up to 24 inches are possible.

For further information write to the Duff-Norton Co., Dept. C&E, P. O. Box 1889, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 61.

check these **HENDRIX** features...

BONUS LOADS

LESS MAINTENANCE

EXTRA PROFITS

- √ LESS BUCKET WEIGHT, for greater capacity.
- √ ALL-WELDED CONSTRUCTION for greater strength and durability.
- √ 14% MANGANESE STEEL chains, fittings and reversible tooth points.
- √ PERFECT PERFORMANCE . . . easier handling . . . faster loading . . . cleaner, smoother dumping.

HENDRIX
DRAGLINE BUCKETS
"A Type for Every Digging Purpose"
¼ to 40 CUBIC YARDS

All Hendrix Buckets available without perforations

HENDRIX MANUFACTURING CO., Inc.
MANSFIELD, LOUISIANA

Hendrix Lightweight DRAGLINE BUCKETS

For more facts, use Request Card at page 18 and circle No. 266

FOUNDATION CONSTRUCTION

CAISSONS
DRILLED AND UNDERREAMED
PIERS

SPECIAL DRILLING PROBLEMS

Offices in Atlanta, Ga., Pittsburgh, Pa., Washington, D.C., Cleveland, Ohio

Wire or phone for a quotation on your next foundation job — ANYWHERE IN THE WORLD

McKINNEY DRILLING COMPANY
NACOGDOCHES, TEXAS
Ph.: LOgan 4-8373 • P. O. Box 190

For more facts, circle No. 267

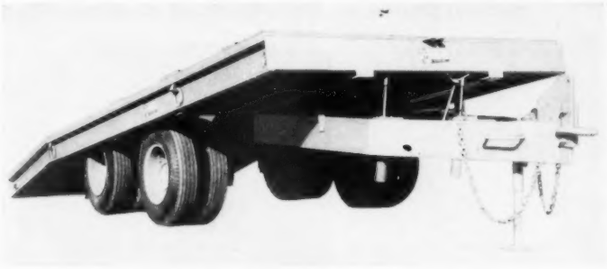
Fourteen-ton tilt trailer features one-man hookup

The Wisconsin Trailer Co. announces a new 14-ton dual-wheel tandem-axle tilt trailer, featuring independent walking bearings that pivot on Timken roller bearings. A feature of the walking-beam assembly is the grease fittings on the main pivot pin, which allow greasing of the bearings inside the beams without disassembling.

Tires are mounted on 48-inch centers.

The 8-foot-wide 2-inch oak deck is 34 inches high. It is available in a 16 or 18-foot length. A beaver tail on the rear of the trailer cuts down the climb angle and allows easy loading of crawler tractors, pavers, shovels, and other equipment.

For further information write to the Wisconsin Trailer Co., Dept. C&E, 1949 N. 121st St., Milwaukee 13, Wis., or use the Request Card at page 18. Circle No. 50.



While heavily constructed, the Wisconsin unit reportedly is balanced so that one man can hook it up to a truck. Convenient handles on the tongue and an adjustable pintle eye are standard equipment.

Diesel turbopower unit produces 360 horsepower

The Detroit Diesel Engine Division of General Motors has developed a 360-hp diesel, which represents a new high in the horsepower range of its line of single engines for contracting and industrial applications. The new engine is a Series 110 model in which a 20 per cent gain in horsepower is attained through turbocharging.

According to the manufacturer, the increase in horsepower from 300 to 360 is attained with no appreciable increase in bulk, weight, or fuel consumption. An exhaust-driven turbine driving an air impeller works with the engine blower to increase the fresh-air supply to the cylinder.

Available with base and radiator, or as a fan-to-flywheel unit, the Model 6-110T has been developed primarily for contractors' equipment and applications requiring a comparatively small unit of high power output.

For further information write to the Detroit Diesel Engine Division, General Motors Corp., Dept. C&E, 13400 W. Outer Drive, Detroit, Mich., or use the Request Card at page 18. Circle No. 10.

Blocks feature shrouds to prevent rope binding

Sauerman Durolite blocks are available with shrouded housings to insure proper seating of the running rope. The shrouds help prevent the rope from binding at the throat of the block, thus reducing breakage and cable wear.

For further information write to Sauerman Bros., Inc., Dept. C-34, Dept. C&E, 620 S. 28th Ave., Bellwood, Ill., or use the Request Card at page 18. Circle No. 118.

26 Mack six-wheeler trucks with 5½-yard mixer bodies, plus four Mack tractor-trailer units to haul aggregate, handle the big part of the hauling requirements of Acme Ready Mix Concrete Co., of Rockford, Illinois. Mack quality construction pays dividends in operating economy and low maintenance costs, enabling Acme to handle both large and small jobs profitably.

From front bumper to rear axle...

QUALITY-BUILT for PROFITABLE HAULING

Ask the men who really know—the men who operate Macks—about the advantages they get from Mack quality construction. They'll tell you about the unexcelled economy . . . minimum down time . . . the extra years of dependable service—that add up to truly profitable operation.

Mack quality begins with Mack-built major components—front and rear axles, engines, frames, transmissions and brakes—which are made to the highest standards in the industry . . . with Mack features like the exclusive Balanced Bogie with Power Divider for positive traction under severe weather and terrain conditions . . . and extends to Mack cabs, which offer the utmost in driver visibility and comfort, easy access to all working parts, and minimum upkeep requirements.

You'll find that Mack quality construction shows up in every phase of operation—and, where it really counts, in net profit figures. Check with your Mack branch or distributor today to find out how Macks' profit-making capabilities can best be put to work for you. Mack Trucks, Inc., Plainfield, New Jersey. In Canada: Mack Trucks of Canada, Ltd.

MACK
first name for
TRUCKS

For more facts, use Request Card at page 18 and circle No. 268

Campbell Cab for . . .
"Caterpillar" D8 and D9 Tractors

HEAVY DUTY—all metal construction to withstand rugged work conditions.

FULL VISIBILITY—360° horizontal visibility.

SAFETY GLASS—windows throughout mounted in locking rubber channels minimizes vibration and breakage. Assures a weather-tight cab.

VENTILATION—doors on both sides of the cab can be locked open or removed for summer-time ventilation.

ENTRANCE & EXIT—sliding doors, one on each side of the cab provide easy entrance and exit.

EMERGENCY ESCAPE HATCH—top panels inserted in rubber moulding can be knocked out from inside and used as an escape hatch in case of emergency.

Height .. 57"
Width .. 54"
Length .. 58½"

Easy to install—cab is installed by bolting to tractor fender and floor boards. Installation time—approximately 2½ hours.

CAMPBELL DETACHABLE CAB CO. • WAUCONDA, ILLINOIS

For more facts, use Request Card at page 18 and circle No. 269

Product Parade

The Type 64 B-L-H shovel-crane.

Offer new excavator, special-duty crane

Two new excavator units, an interchangeable shovel-crane and a rig designed for special crane service, are announced by the Construction Equipment Division of the Baldwin-Lima-Hamilton Corp. Both feature Lima "precision" air control.

The Type 64 interchangeable unit has a rated capacity of 40 tons when equipped as a crane. When equipped as a shovel, it has a 22-foot boom, 17-foot dipper handle, and 1¼-cubic-yard dipper.

The Type 64-SC is designed for special crane service and has a rated capacity of 50 tons. Features and available equipment for crane service include power load-lowering device; independent propel; hoist-drum reversing device; third drum attachment; safety boom stop; pin-connected boom of high-strength alloy-steel tubular-type construction welded throughout with a cross section of 48 × 48 inches. The boom can be extended to 150 feet.

The Types 64 and 64-SC have identical truck bases. Two widths of axles and two lengths of crawler side frames are available. The standard crawler is 13 feet 3 inches long and 10 feet 8 inches wide with 30-inch treads. For special crane and dragline service, requiring an extra-long, wide crawler, the company can furnish a crawler that is 17 feet 1½ inches wide, with a spread of 14 feet and 42-inch treads.

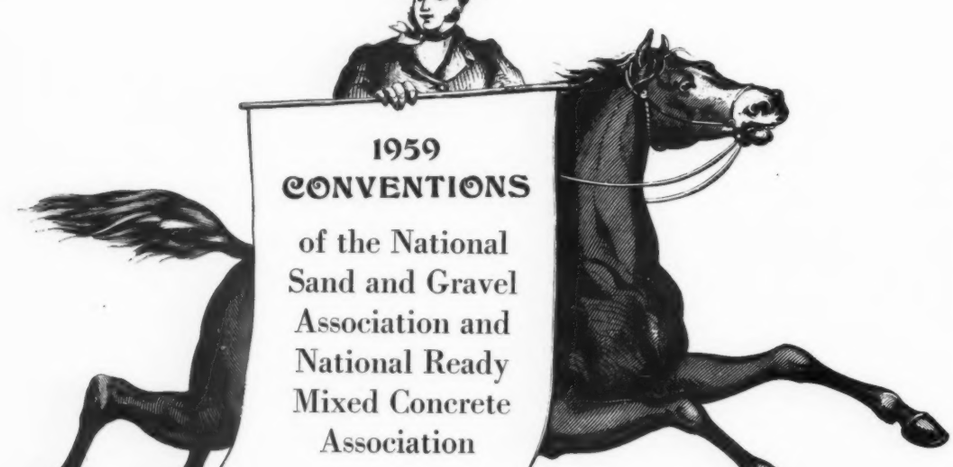
Gasoline, diesel, or electric power with torque converter provides ample power for hard digging and heavy lifts, the manufacturer reports.

For further information write to the Baldwin-Lima-Hamilton Corp., Construction Equipment Division, Dept. C&E, Lima, Ohio, or use the Request Card at page 18. Circle No. 13.

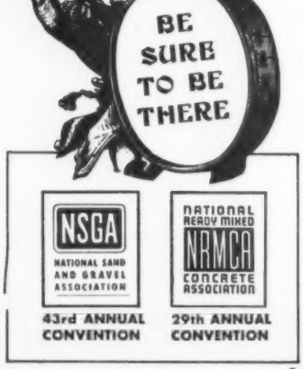
New transport boasts fast load, dump cycle

A rubber-tire self-loading, self-dumping transport said to permit quick, economical handling of rock, aggregate, and other construction materials is announced by Sanford-Day Iron Works, Inc. The machine has a 6-ton payload capacity.

The Gismo Transloader consists basically of a 2-wheel overhung-en-



YOU'VE GOT A DATE IN NEW ORLEANS



TIME: February 16-19*
PLACE: The Roosevelt Hotel

You owe yourself and wife this trip to famous old New Orleans.

You owe your business this all-important meeting with your associates to discuss the vital problems and important opportunities that face your industry.

What's ahead in building materials markets, in our industry's management-labor relations . . . engineering and research, our laboratory operation . . . progress in the fast developing public relations programs . . . progress in safety and adaptation to new zoning requirements . . . up-to-date information on taxation, freight rates, cost analysis, mobile radio, merchandising . . . these are some of the subjects scheduled for round table and panel discussions.

Make your plans—make your hotel reservations and . . . *be sure to be there!*

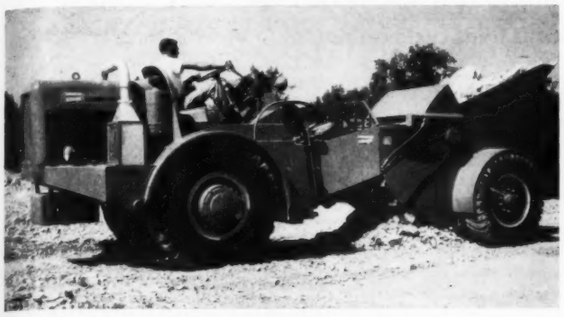
NSGA NATIONAL SAND AND GRAVEL ASSOCIATION — 43rd ANNUAL CONVENTION

NATIONAL READY MIXED NRMCA CONCRETE ASSOCIATION — 29th ANNUAL CONVENTION

*Convention registrations will begin at The Roosevelt Friday morning, February 13.

*Committee meetings start February 13. General sessions open Tuesday, February 17 and continue twice daily through Thursday afternoon.

For more facts, use Request Card at page 18 and circle No. 270



With dipper raised, the new Gismo Transloader dumps rock through its rear bottom-dump door.

gine tractor and a 2-wheel loading-hauling-dumping unit. The latter is equipped with a large dipper with teeth, intermediate fold-back mechanism with adjoining self-contained haulage body, and dump door. The dipper and fold-back mechanism "cascade" material being loaded into the hauling body for transport.

Operational features of the Transloader include high-speed transporting (up to 20 mph either forward or reverse, with choice of three speeds); power brakes, power steering, and torque-converter drive; and convenient fingertip control of the hydraulic winch activating dipper and dump doors. Because the machine travels equally well backward or forward, a faster loading-hauling-dumping cycle is possible, the manufacturer reports.

The new machine is 25 feet 10 inches long, 7 feet 9 inches wide, and 8 feet high.

For further information write to the Sanford-Day Iron Works, Inc., Dept. C&E, Dale Ave., Knoxville, Tenn., or use the Request Card at page 18. Circle No. 39.

New attachment offered for welder paralleling

A new attachment, which simplifies the paralleling of two arc welders to use their combined capacity for such work as automatic welding, arc cutting, and stud welding, is announced by Hobart Bros. Co. The unit is also designed to provide protection to the welders in case either machine is set or adjusted improperly, or fails to perform properly.

Completely enclosed in a steel case 13 inches long, 16 inches wide, and 15 inches high is a magnetic contactor, controlled by a push button and by a protective current relay, with a light to indicate when the contactor closes. Should the two welders become badly unbalanced, current will flow in the equalizer circuit, tripping the protective relay, which trips the contactor.

Components are such that the attachment functions in use with any Hobart electric, gasoline, or diesel-powered rotating-type dc welder that is rated on the basis of 60 per cent duty cycle or higher. Approximate weight of the unit is 145 pounds.

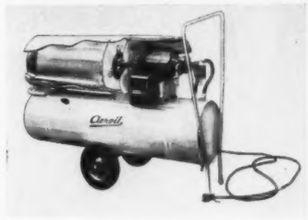
For further information write to Hobart Bros. Co., Dept. C&E, Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 121.

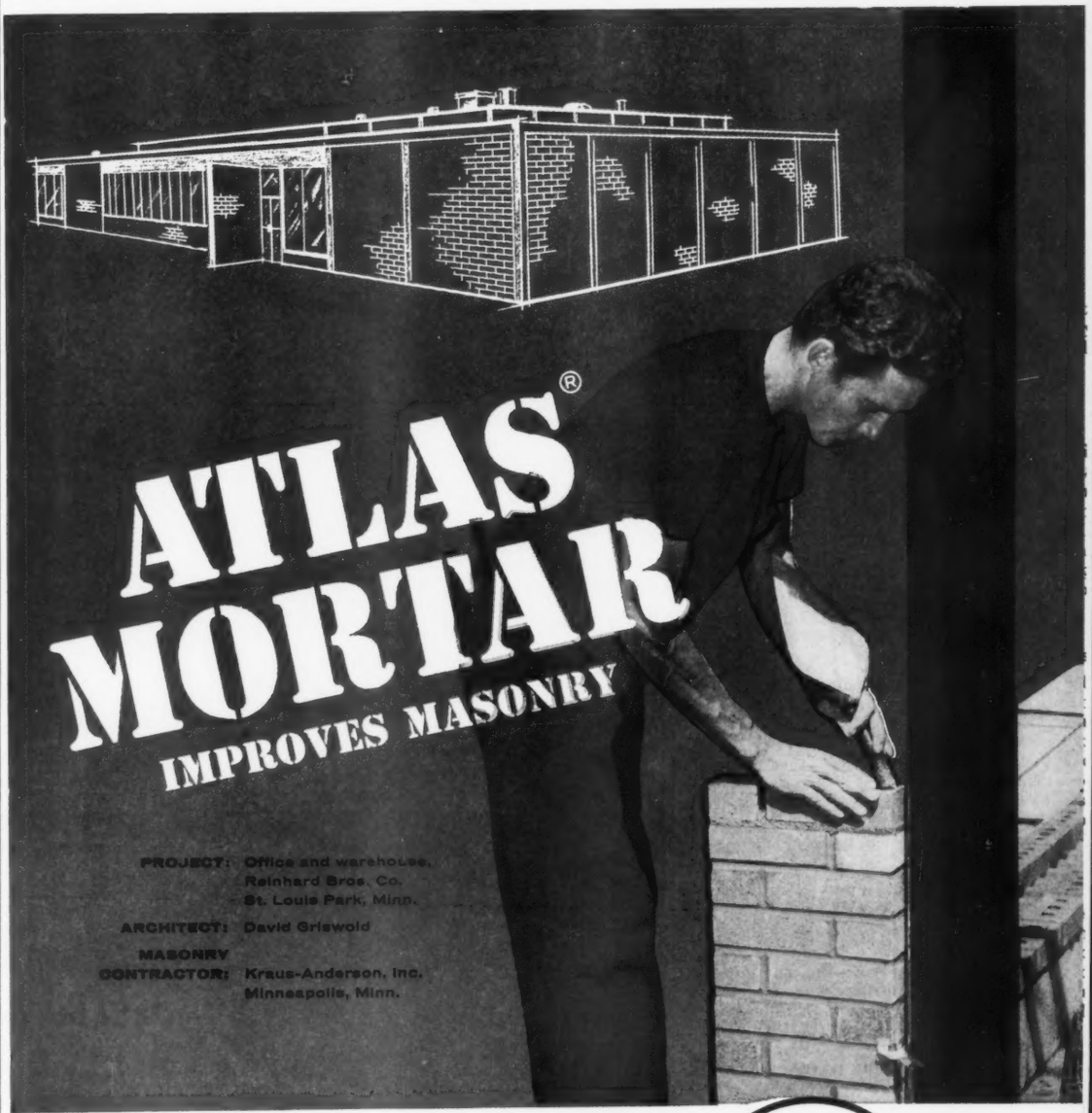
Portable space heaters work off ac current

A new line of portable blower-type space heaters with Btu outputs from 125,000 to 500,000 is announced by Aeroil Products Co., Inc.

The units plug in on ordinary ac current and are said to have an exceptionally high volume of air delivery without danger from carbon monoxide gas. The fuel tank is large enough to keep the smallest model running all night, Aeroil says.

For further information write to Aeroil Products Co., Inc., Dept. C&E, 75 Wesley St., South Hackensack, N. J., or use the Request Card at page 18. Circle No. 122.

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MORTAR
IMPROVES MASONRY
PROJECT: Office and warehouse, Reinhard Bros. Co. St. Louis Park, Minn.
ARCHITECT: David Griswold
MASONRY CONTRACTOR: Kraus-Anderson, Inc. Minneapolis, Minn.

"... provides a more uniform, workable mortar,"
says R. J. Randolph, Mason Foreman
Kraus-Anderson, Inc.
Minneapolis, Minn.

- To produce serviceable, watertight masonry walls, the mortar mix must be plastic—and have adequate "board life."
- Masons on the job consistently confirm that ATLAS MORTAR cement *does retain* its workability—and gives higher yields.
- Quality-controlled manufacture of ATLAS MORTAR cement maintains high product standards, assuring uniform performance and appearance on every project.
  (*Complies with ASTM and Federal Specifications.*)

Write for your copy of "Build Better Masonry," Universal Atlas, 100 Park Avenue, New York 17, N. Y. M-69

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Universal Atlas Cement
Division of United States Steel

USS TRADE MARK

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For more facts, circle No. 271→

New internal cross-bracing design of the Link-Belt Speeder Hi-Lite boom is said to cut long boom deflection and whipping action to a safe minimum.

New boom, jib design extends crane reach

Link-Belt Speeder announces its new Hi-Lite booms and jibs that add 20 to 60 feet in usable height to former crane boom designs.

According to the company, these new booms are designed to provide maximum boom and jib lengths up to 200 feet. Maximum heights of 160, 180, and 200 feet are obtainable for unassisted lifts from the ground of Link-Belt Speeder's new 30, 35, and 40-ton lifting cranes.

The new booms and jibs represent a modern adaptation of the tetrahedron, a geometric figure made up of four triangular sides and said to be the strongest figure applicable to crane boom design. In the new boom design, a series of these interrelated figures locks all members into an exceptionally rigid structure, fully braced against loads in every direction.

The square tubular chords and round tubular internal cross bracing are of high-strength lightweight tubing, and when coupled with the deeper box section—44 inches square—provide extra strength for more capacity at extreme radii, the company claims.

For further information write to the Link-Belt Speeder Corp., Dept. C&E, 1201 Sixth St. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 34.

Kit regulates heat cycle on portable blower heater

The Insto-Gas Corp. announces a thermostat kit for use with its No. 1710B LP-gas-fired portable blower heater.

Known as the No. 1722 conversion kit, it can be furnished with a No. 1710 unit from the factory, or may be easily adapted in the field for thermostatic control. The kit provides for on and off regulation of the heat cycle of the blower heater to maintain even temperatures and to assure maximum gas economy, according to the manufacturer.

For further information write to the Insto-Gas Corp., Dept. C&E, 998 E. Woodbridge Ave., Detroit 7, Mich., or use the Request Card at page 18. Circle No. 80.

CM
Hammerlok®
COUPLING LINK

Make your own
HERC-ALLOY
Chain Assemblies
with all components furnished from your distributor's stock.

NO PEENING NO WELDING

● Hammerlok is made of alloy steel... is stronger than Herc-Alloy chain... is thoroughly field tested.

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For more facts, circle No. 272

LIGHTS POWER
WELD ANYWHERE
with this new low cost
HOBART ac Power/Weld dc

Model GB-3186-S
Gas Drive with 6 or 12 KW AC auxiliary power
Model GPB-258-S
"Contractor's Special"
Model SP-418-W
Self-propelled U-Drive-It "Big Wheeler" gas drive welder

Portable mountings available if desired

Take it to the job. This lightweight combination unit welds anywhere or furnishes power for running tools, lights, motors, etc. No delays—no electrical connections to make. Ready to go to work for you on a moment's notice, when and where you need welding and auxiliary power. Invaluable as emergency standby service should regular power fail. The Power/Weld furnishes 5 KW full time 110/220 AC power on a permanent basis. Be sure to see and try this new low cost two-in-one unit.

write for complete details—without obligation!

BUY WITH CONFIDENCE FROM THE
"Manufacturers of the world's most complete line of arc welding equipment"

HOBART BROTHERS CO.
BOX 8128, TROY, OHIO, Phone FE 2-1223

For more facts, use Request Card at page 18 and circle No. 273

ANOTHER BMCO FIRST!

13 WHEEL SELF-PROPELLED ROLLER

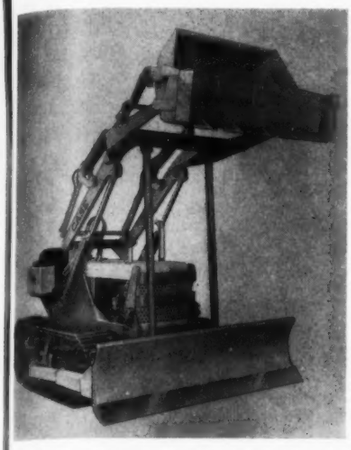
NOW . . . YOU CAN CUT YOUR COMPACTION TIME IN HALF!
This new exclusive BMCO 13 wheel roller makes it possible for you to do the same amount of work in half the time!

With complete oscillation on all wheels and power steering this 13 wheel BMCO compactor is easy to handle. With the largest power unit in its class and extra displacement . . . this is the compactor for you in '58.
For more information write, wire, or phone!

MORE COMPACTION
FEWER PASSES
50% LARGER

BMCO
BROWNING MANUFACTURING CO.
111 HUMBLE AVENUE P. O. BOX 2707
SAN ANTONIO 6, TEXAS

For more facts, use Request Card at page 18 and circle No. 274



The Model 310 loader-dozer is fitted here with an 84 × 25½-inch angle-dozer blade. With the blade removed, the machine digs and dumps like any standard Case ⅝-yard loader.

Loader-dozer unit offered on tracks

A new 2-in-1 combination ⅝-cubic-yard loader and dozer is offered by the J. I. Case Co.

The unit reportedly can be switched from dozer to loader operation in only 5 minutes, with no change in the single hydraulic system that operates both tools.

A basic Utility Model 310 crawler tractor is employed, developing 30 drawbar horsepower and 5,690 pounds drawbar pull or push. The loader applies 4,300 pounds breakaway force, lifts 2,600 pounds to over 9 feet in height, and clears 8 feet 10 inches after dumping.

For further information write to the J. I. Case Co., Dept. C&E, 700 State St., Racine, Wis., or use the card at page 18. Circle No. 46.

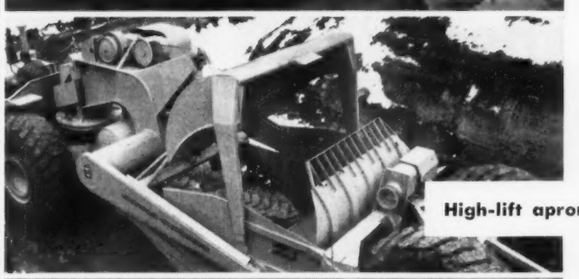
Electric utility drill is lightweight, powerful

A new ½-inch electric utility drill is offered by the Black & Decker Mfg. Co.

Powered by a special B&D-built drill motor, the unit reportedly drills diameters up to ½ inch in steel, ¾ inch in masonry, 1 inch in hardwood, and drives hole saws up to 2 inches in any material a hacksaw will cut.

For further information write to the Black & Decker Mfg. Co., Dept. C&E, E. Pennsylvania Ave., Towson 4, Md., or use the Request Card at page 18. Circle No. 124.

A new clearing and grubbing tool designed to uproot a stump of any size in a matter of a few minutes, and at the same time split it into such small pieces that it can be burned on the spot, the Bles stump ax can be mounted on any crane or shovel of ¾-yard capacity. It reportedly will cut a stump at any depth, and with it as much or little of the root as desired may be cut out. For further information write to the **M. J. Bles Construction Co.**, Dept. C&E, McLean, Va., or use the Request Card at page 18. Circle No. 42.



28-yd. B Fullpak® scraper moves big yardages...fast

B Tournapull®, with 28-yd. Fullpak, is your fastest loading scraper for volume earthmoving . . . top money maker for moving big yardages *fast*. You get these advantages in this LeTourneau-Westinghouse machine:

Positive power ejection . . . faster spreading

At the touch of an electric switch, operator moves vertical tailgate forward to eject load. Tailgate wipes bowl clean of mud, marl, or sticky clay in a single pass. Inside of bowl is cleanly designed, no angular obstructions to block material flow. With fingertip electric control, tailgate may be moved to any position in the bowl to create lively boil of material while loading. Curved top of tailgate rolls material into corners for fast fill and rounded heap.

High-lift apron makes sure anything that goes in comes out — fast

Apron lifts quickly to make an opening 10′ wide x 7′1″ high. Plenty of clearance to handle hunks of sod or gumbo, rocks, and other chunky materials. Deflectors on yoke arms prevent trapping of stones and sticky clay that might require manual cleaning. Large diameter cable-drum on apron-hoist permits fast spooling without kinking, increases rope life. In closed position, apron carries big part of load for better distribution of weight, greater stability.

More visibility . . . assures faster loading and spreading

Operator seat on new "B" is high and left-of-center. He can see blade, load, and pusher merely by turning his head. This makes it easy to position machine for better coordination with push-tractor and see signal for quick break-away the moment load is heaped. He can guide the big machine easily along narrow haul-road in the pit, on fill, and over rough terrain.

More speed . . . with instant, positive electric controls

An exclusive advantage on all LeTourneau-Westinghouse earthmovers. With fingertip electric control operator handles all movements of bowl, apron, and tailgate. He has power-steering, too, as on a modern automobile. He sits in a comfortable foam-rubber seat . . . with hands resting comfortably on wheel and control panel. No twisting of body or stretching of arms to reach awkward levers . . . your Tournapull operator works relaxed . . . he concentrates on getting bigger loads in less time . . . to give you "more for your money."

Get full details on the B Fullpak. See why it will help you move dirt faster, easier, at lowest-net-cost-per-yard. Write or phone for all the facts.

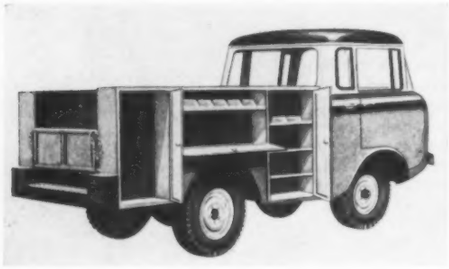
*Trademark BP-1538-D

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 275



Especially designed for Jeep chassis, the Reading utility bodies feature adjustable or permanently installed shelves in all compartments as well as adjustable and removable shelf and tray dividers.

Utility bodies offered for light-duty trucks

A new series of utility truck bodies for Jeep chassis is offered by the Reading Body Works, Inc.

The bodies feature adjustable or permanently installed shelves in all compartments, as well as adjustable and removable shelf and tray dividers.

The entire body is electrically welded into one integral unit, with the front panel ribbed to protect the cab against shifting loads.

A 90-inch model is designed for Jeep chassis FC 150, and a 108-inch model for chassis FC 170.

Optional equipment includes a sliding steel top and a pipe vise rack.

For further information write to the Reading Body Works, Inc., Dept. C&E, 420 Gregg Ave., Reading, Pa., or use the Request Card at page 18. Circle No. 123.

Air-powered sludge pump offers 175-foot head

A Thor air-powered sludge pump, said to remove 42 gallons of sediment-filled water a minute at a 175-foot head, is announced by the Thor Power Tool Co.

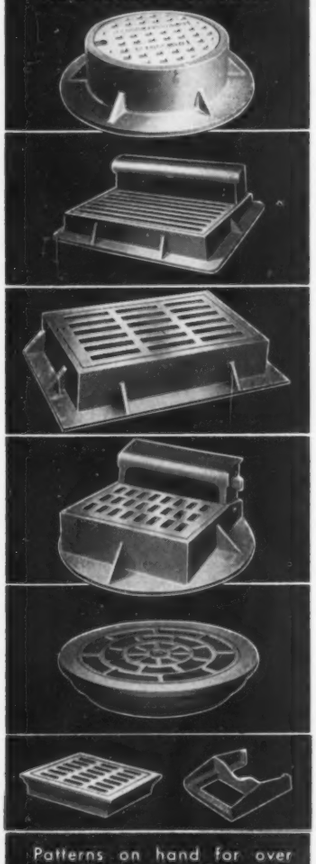
Designated No. 275, the unit has no motor, and its few working parts are stainless steel and automatically lubricated. Designed for continuous 2-stage breathing cycle, the pump draws in sediment by air suction until its tank capacity is reached, then automatically changes cycle to close the inlet valve, open the outlet valve, and expel the contents under pressure.

Capable of entering an opening 18×12½ inches, the pump can draw in water containing sand, rock cuttings, and other sediment up to 20-foot suction lift.

For further information write to the Thor Power Tool Co., Dept. C&E, 175 N. State St., Aurora, Ill., or use the Request Card at page 18. Circle No. 57.

NF

CONSTRUCTION CASTINGS OF
★ SOUND QUALITY
★ SUPERIOR FINISH
★ SOLID VALUE
DELIVERED ON TIME



Patterns on hand for over 15,000 different Gray Iron and Ductile Iron construction castings.

Write for our new 165-page completely illustrated catalog.

NEENAH
FOUNDRY COMPANY
NEENAH · WISCONSIN
Chicago Office 5445 North Neva Ave Chicago 31, Illinois

For more facts, circle No. 276

Here's LOW COST Loading-Screening

KOLMAN MODEL 202 CONVEYOR

Model 202, 40' x 24", 6' x 36" Model 58-60 Screen, Model VH-4, 17 to 30 HP Wisconsin gasoline air-cooled engine, attached Reciprocating Plate Feeder, Hopper and roof type grizzly bars.

Single-deck vibrating screen folds into towing position without dismounting screen or any of the drive assembly.

Rugged construction of Model 202 permits use of double-deck KOLMAN screen to make several sizes of material at once.

Sturdy design of Model 202 permits installation of loading trap on tail section, portable without disassembly.

Rugged Box-Type Construction Permits Amazing Low Price

The Model 202 meets the demand for a conveyor in the low price field stout enough to carry a large single or double-deck vibrating screen and loading trap in a completely portable conveyor-screen plant.

"Box-Type" Construction

The rugged "box-type" construction of the Model 202 conveyor gives it unusual strength and rigidity. The sides are fabricated of 3/16" steel plate formed into a channel 16" deep with 2" legs. The steel belt cover reaches completely across the top, completing the box and completely encasing the return belt to prevent materials from working in to cause belt damage.

The under-slung power unit provides easy access for servicing and operation.

Folding Feature

The 202 is available with the Head Pulley Clutch feature which allows the belt to be stopped and started while the vibrating screen remains in operation.

The KOLMAN Model 202 is rugged enough to carry a loading trap and large vibrating screen without additional support. It will take the kind of punishment that is dished out in a portable outfit—and will cost you far less money to own and operate. Available in 18" or 24" belt width, in lengths up to 50'.

For Further Information Write or Wire
KOLMAN MANUFACTURING COMPANY
4922 West Twelfth St., Sioux Falls, S. D.
or see your nearest Kolman dealer

For more facts, use Request Card at page 18 and circle No. 277

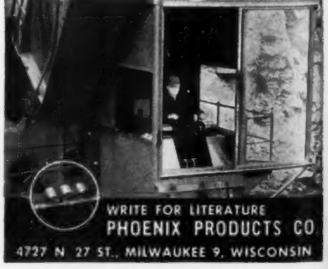
Thirty-six STURDILITE HEAVY DUTY FLOOD LAMPS used on

Whether it's this colossal Marion shovel with a 70 cu. yard bite, or medium size or small machines, STURDILITES are providing better light, longer lamp life, at lower cost, for users of all types of mobile mining and construction equipment.

STURDILITES are recognized the world over as standard equipment where vibration, shock and generally rough treatment present lighting problems.

High and low voltage models for every requirement. If not available at your dealer write direct for complete information.

* Trade Mark Registered



For more facts, circle No. 278

Use the Request Cards Between Pages 18 & 19 To Obtain Further Information or Printed Matter on Any Product Advertised or Described Editorially in This Issue

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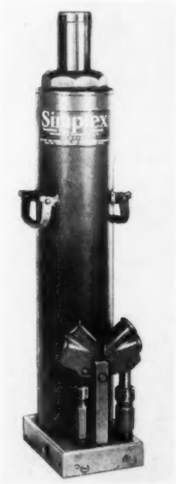
The rear-axle capacity of the Ford F-600 medium-duty trucks in 1959 is said to be up to 2,000 pounds greater than that of many other makes of comparable size. The Ford mediums are new from modern grille and headlights to the more rugged cab with new interiors. A 6,000-pound front axle is also available. Standard equipment for this truck is a 139-hp, 223-cubic-inch, 6-cylinder engine; V-8's are optional. For further information write to the **Ford Division, Ford Motor Co.**, Dept. C&E, P. O. Box 658, Dearborn, Mich., or use the Request Card at page 18. Circle No. 75.

Announce two new models in hydraulic jack line

Two new "high-lift" hydraulic jacks have been added to its Simplex line by Templeton, Kenly & Co. Each has a capacity rating of 25 tons and is equipped with both high and low-speed pumps which may be operated singly or in unison.

The Model 25H28 has a closed height of 28 inches, with a 22-inch



lift giving a total height of 50 inches. It weighs 125 pounds. The Model 25H22 has a closed height of 22 inches, with 16 inches of lift for a total height of 38 inches. This jack weighs 105 pounds.

Both models are designed to lift 50 per cent over their 25-ton rated capacity. They may be operated in either vertical or horizontal position, and are equipped with double lever sockets to permit operation in close quarters. With their unusually high lift, these jacks are said to be suitable for all types of lifting and pushing jobs in general construction, including drilling and bridge and culvert work.

The line of Simplex hydraulic jacks includes models ranging from 3 to 100 tons in capacity.

For further information write to Templeton, Kenly & Co., Dept. C&E, 16th St. and Gardner Road, Broadview, Ill., or use the Request Card that is bound in at page 18 of this issue. Circle No. 33.

Your grader-- production tool?...or overhead?

Make no mistake! Your grader is a production tool. It's *not* just an "overhead" item, or a "necessary evil" — as some might think. The work a grader does can be measured in yards of dirt moved per day... in days of earlier contract completion... in miles of ditch or grade finished to specification.

Grader more than earns its keep

While a grader does not load and carry dirt, it can increase over-all earthmoving production. It can smooth and drain roads so your haulers can "highball" more loads per day. It can spread fill evenly, for easier compaction... for faster on-the-run spreading. Your grader can maintain drainage in cut and fill... cut rainy weather delays... and eliminate soft spots that might slow or stop haulers.

The resulting speed-up, and extra production of your dirtmoving fleet is really the way to measure the pay-yard output of your graders. You get a saving in cost-per-yard... faster completion of your jobs... a substantial increase in your profits.

Bigger output adds to profits

The amount of work your grader can do has a direct bearing on *how much* profit it earns. A machine that cuts deeper, pushes a heavier load, turns a bigger windrow faster, will complete more work. You'll have more machine-time available to help speed-up the loading cycle... to assist pushers... to scarify tough spots... to windrow dirt for faster scraper loading.

Blade-accuracy cuts costs

The precision with which your machine cuts ditches and finish grades is very important, too. Exact control of the blade setting, the ability to hold that setting, and a minimum of deflection in tough materials... *all* reduce the number of "passes" required to finish to specifications.

Extra work-power for your grader dollar

You'll find that an Adams* grader will help you move more dirt faster, will shape-up more finished grade per day than any other comparable grader, for these 5 big reasons:

1. These LeTourneau-Westinghouse machines always work at, or nearer, full power. You have more working speeds, with less differential between each gear-ratio... always a "just-right" gear to blade at full power, and fastest practical speed.

2. Adams' fast travel speed (to 26 mph) saves time between jobs... high reverse speed (to 13 mph) gives you more push-cycles on one-way blading.

3. You get bonus push-power because 100% anti-friction drive delivers bigger percentage of engine power to tandem drive wheels.

4. The moldboard on an Adams is easier to control, because direct engine power always moves it at constant speed.

5. Husky "wishbone" frame provides a steady blade-mount... it always holds firm and rigid at Adams' faster working speeds.

See how Adams boosts your profit

Call or write and ask us to demonstrate any of the 7 Adams models, rated at 60 to 190 hp.

Every working day, this Adams 550 grader makes money for its owner, Harrison Construction Co., Pittsburgh, Pennsylvania. Here, building an earthen dam on the edge of a 45-acre settling basin for ARMCO Steel Corporation, near Butler, Pa., grader spreads a layer of fill for speedy compaction... for on-the-run spreading by earthmovers. "550" also keeps roads smooth to boost speed of dirt-movers hauling approx. 10,000 yds. daily, in two 9-hour shifts. Dam will be about 3000' long, 70' high, 410' wide at base, and 20' wide at top.

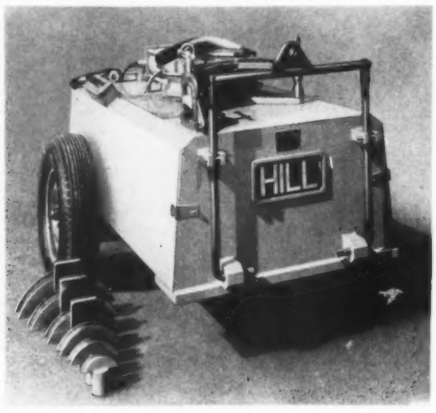
*Trademark G-1742-DCJ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

For more facts, use Request Card at page 18 and circle No. 279



New hydraulic bender offers easy portability

A portable hydraulic bending and pipe-fabricating machine is available from Walter P. Hill, Inc.

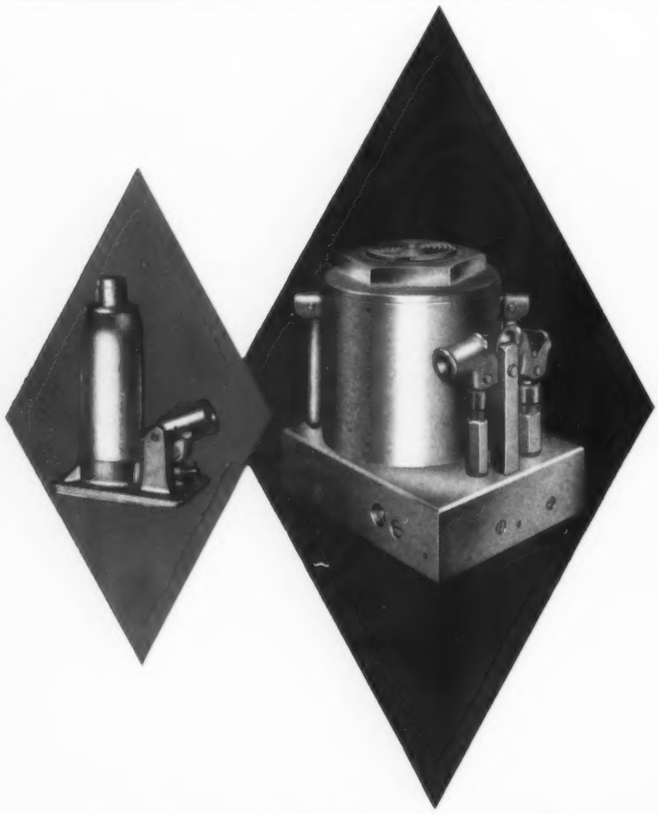
The 2,500-pound unit is mounted on two trailer-type pneumatic-tire wheels and a castered front wheel.

The bender can be moved by pushing it like a dolly, pulling it behind a material-handling truck, or hauling it over the highway like a 2-wheel trailer. It has a built-in 20-ton ram-type hydraulic bending machine, powered by a self-contained 1,200-rpm, 2,000-psi, 5-gpm hydraulic pump and tank unit. This unit reportedly will bend electrical conduit pipe up to 2½-inch diameter, solid bars up to 1½-inch diameter, and angle forms. Adjustable bends with radii five times the pipe diameter can be produced.

Bending dies for ½, ¾, 1, 1¼, 1½, and 2½-inch-diameter pipe are furnished with the unit, along with a mounted standard pipe vise.

For further information write to Walter P. Hill, Inc., Dept. C&E, 22183 Telegraph Road, Detroit 19, Mich., or use the Request Card at page 18. Circle No. 100.

Full hydraulic control of all actions is a major feature of the Davis Hydraxcavator. The machine is available in three basic types: Model A-4, which is wagon-mounted; Model AT-4, which may be mounted on a truck of the owner's choice; and Model B-4, which is mounted on a specially designed carrier. All units can be used with a wide range of end attachments. Hydraulic down pressure is a feature of the clamshell, which may be readily changed in a matter of minutes with the shovel or backhoe attachment. The 360-degree swing of the upper mechanism permits loading out over the cab end of the carrier, as required. A new extra-long boom allows a digging depth to 13 feet 6 inches. For further information write to **Davis Engineering, Inc.**, Dept. C&E, P. O. Box 127, Dowagiac, Mich., or use the Request Card at page 18. Circle No. 96.



TWELVE EASY WAYS TO LIFT
FROM 3 TO 100 TONS—USE
DUFF-NORTON HYDRAULIC JACKS

Designed for ease of operation this rugged, dependable line of Duff-Norton hydraulic jacks gives you rapid rise with minimum effort. Twelve models in 10 different capacities ranging from 3 to 100 tons meet the lifting requirements of all types of industry.

Duff-Norton Hy-Power Hydraulic Jacks are stocked by your distributor. For quick delivery call him the next time you need a jack, or write for a copy of Bulletin AD-16aS to obtain complete details and specifications.

DUFF-NORTON COMPANY
P. O. Box 1889 • Pittsburgh 30, Pennsylvania
COFFING HOIST DIVISION • Danville, Illinois

DUFF-NORTON JACKS
Ratchet • Screw
Hydraulic • Worm Gear

COFFING HOISTS
Ratchet Lever
Hand Chain • Electric

For more facts, use Request Card at page 18 and circle No. 280

Fast-Driving, Versatile
VULCAN
DGH-100
PILE HAMMER
speeds work on sewer project

The Vulcan DGH-100 Portable, Differential-Acting Hammer is driving 3" x 8" x 24' timbers to a depth of 20 feet to form bins 8' wide and 24' long used in the construction of a sewer line in Edina, a suburb of Minneapolis. Contractor: Phelps-Drake Co., Minneapolis. The Vulcan DGH-100 is a favorite with contractors everywhere.

Ask for full information

Manufacturers of Pile Driving Hammers and Piling Extractors Since 1852
VULCAN IRON WORKS INC. 327 North Bell Avenue, Chicago 12, Illinois

For more facts, use Request Card at page 18 and circle No. 281

Pan-type mixer offered for prestressed industry

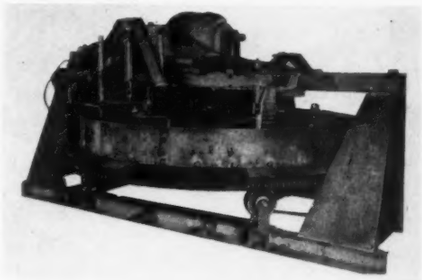
Gyr-A-Mix, a new pan-type mixer for concrete-block and prestressed-concrete producers, is offered by the Concrete Transport Mixer Co.

According to the company, this mixer efficiently produces uniform high-quality concrete, reduces mixing time, and mixes more thoroughly.

The unit has two rotors, each with three blades, which rotate at a speed of 42 rpm. The mixing pan revolves at 6 rpm and feeds the rotating blades. Additional mixing action is accomplished by four stationary blades, which also force material into the rotating blades. Two scrapers keep the side of the pan free from material build-up.

Standard Gyr-A-Mix sizes are 20 and 40 cubic feet, and special sizes can be furnished.

For further information write to the Concrete Transport Mixer Co., Dept. C&E, 4985 Fyler Ave., St. Louis 9, Mo., or use the Request Card at page 18. Circle No. 111.



Designed for concrete-block and prestressed-concrete production, this 40-cubic-foot-capacity Gyr-A-Mix stands 6 feet 10¼ inches high, 10 feet 3 inches wide, and 14 feet 6 inches long. Its approximate weight is 13,500 pounds.

High-speed photocopier is lightweight, portable

A new high-speed office photocopier is announced by the American Photocopy Equipment Co.

Called Director Auto-Stat, the machine weighs 25 pounds, measures 11 inches deep and 20 inches wide, and is said to have the copying capacity of a larger unit. It is capable of reproducing any office-sized document in about 19 seconds, the company reports.

The unit is designed to produce sharply defined black-on-white copies of any written, typed, printed, drawn, or photographed original.

For further information write to the American Photocopy Equipment Co., Dept., C&E, 2100 W. Dempster St., Evanston, Ill., or use the Request Card at page 18. Circle No. 86.

A high-visibility canvas all-weather cab is announced for the American Econmobile all-purpose material-handling vehicle. The cab is made from Cartex No. 8 canvas, dry-treated to be moisture repellent, using large sections of clear, flexible vinyl plastic in the sides, back, and roof. The windshield is made of ⅛-inch Flexiglas, measuring 3×4½ feet. The windshield is held in place by steel channels and members. For further information write to the **American Road Equipment Co.**, Dept. C&E, 4201 N. 26th St., Omaha, Nebr., or use the card at page 18. Circle No. 87.

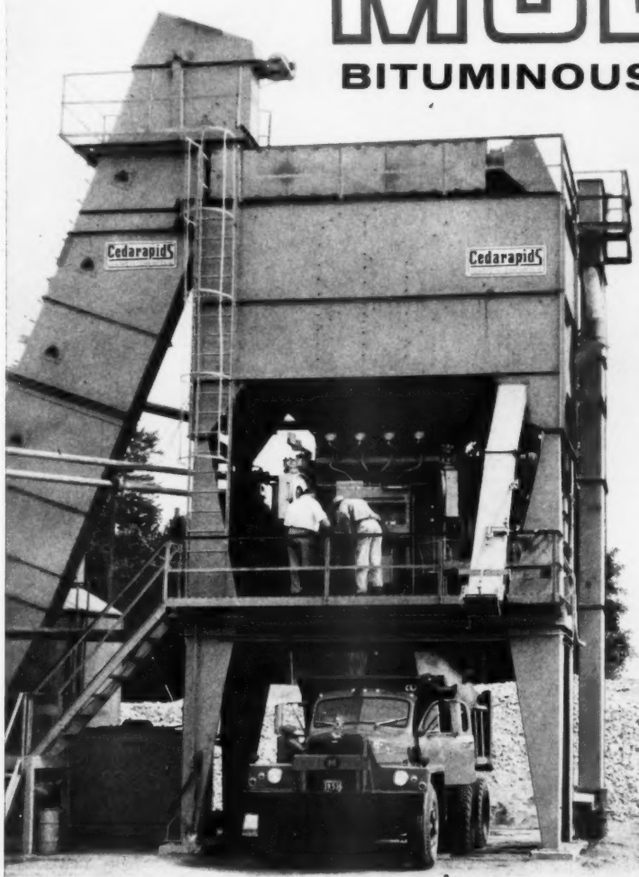
For more facts, circle No. 282→

. . . to reduce hot-mix production costs still more!

Cedarapids announces a new line of

MODEL H

BITUMINOUS MIXING PLANTS



LOW INITIAL COST When 100% portability is unnecessary in your operations, a Cedarapids Model H Bituminous Mixing Plant is your best bet. These stack-up, batch-type plants are designed without running gear or self-erecting equipment to lower your initial investment and reduce maintenance.

SAME ADVANTAGES OF MODEL G PLANTS Except for portability, Model H Plants give you the same efficient features you'll find on Cedarapids Model G plants . . . high capacity (up to 200 tons per hour or more); all-automatic operation on the three larger models; maximum flexibility for meeting a wide range of specifications; rugged, low-maintenance design and construction.

MEETS EXACTING SPECIFICATIONS New Models H 60, H 50, and H 40 weigh, batch, mix, discharge and start a new cycle *automatically*, and the finished product of each cycle conforms to the most exacting specifications without variation. On Models H 20 and H 15, simple manual controls assure accurate weighing to meet strict specifications.

DESIGNED FOR PERMANENT OR SEMI-PERMANENT OPERATIONS Sectionalized units of Model H Plants can be quickly stacked up by crane for stationary installation. When necessary to move, the sectionalized units are easily transported by low-bed trailer.

FIVE SIZES to meet your volume demands

MODEL H 60	up to 7500-lb. batches*	CAPACITY: 200 *plus* TPH
MODEL H 50	up to 5000-lb. batches*	CAPACITY: 150 to 180 TPH
MODEL H 40	up to 4000-lb. batches*	CAPACITY: 120 to 150 TPH
MODEL H 20	up to 2000-lb. batches*	CAPACITY: 60 to 80 TPH
MODEL H 15	up to 1500-lb. batches*	CAPACITY: 45 to 60 TPH

* depending upon weight of aggregate, drying conditions and job specifications.

■ You can't beat any Cedarapids Bituminous Mixing Plant for economical, profitable operation! But now, in keeping with the Cedarapids policy of offering *every* producer the kind of plant he needs to get the good contracts with low bids, Cedarapids offers a new, complete line of lower cost asphalt plants. The new Model H series plants retain all the efficient production features of the popular G 60 and G 40 models, yet reduce your initial investment to cut over-all production costs to rock-bottom levels. If your bituminous mixing operations call for permanent or semi-permanent installation, be sure to investigate the profit advantages of new Model H Plants. Ask your Cedarapid Dealer for details today.

IOWA MANUFACTURING COMPANY
Cedar Rapids, Iowa, U.S.A.

Ad No. 458-N

Cedarapids Built by

Product LITERATURE

To obtain free copies of any of the literature described in the following section, circle the designated number on the Request Card at page 18.

Power takeoffs—a folder on the complete line of Tulsa power takeoffs for a wide range of purposes and applications. Lists the main features of these units and includes a handy, comprehensive application reference chart covering many models of major-make trucks.

Write to Tulsa Winch, Division of Vickers Inc., Dept. C&E, 815 E. First St., Tulsa, Okla., or use the Request Card at page 18. Circle No. 71.

Small-parts cleaning agent—data on Spray Nuts Off, a combination of oils, penetrants, and chemicals designed for cleaning small parts, spark plugs, battery terminals, and carburetors. According to the literature, there is no offensive odor and no loss from spillage or evaporation.

Write to the Spray Products Corp., Dept. C&E, P. O. Box 584, Camden 1, N. J., or use the Request Card at page 18. Circle No. 72.

Belt conveyors—a folder describing the Cost-Cutter all-purpose belt conveyor. Illustrates 22 types, including undercarriages and supports. General specifications.

Write to the New London Engineering Co., Dept. C&E, 1700 S. Division St., New London, Wis., or use the Request Card at page 18. Circle No. 70.

Three-way dump body—an illustrated specification sheet on the Koenig combination rear-dump, side-dump, and drop-side body. According to the literature, the units are adaptable to all standard chassis. Covers models with capacities from 3 to 6 yards.

Write to Koenig Iron Works, Inc., Dept. C&E, W. 12th and Ella Blvd., Houston 7, Texas, or use the Request Card at page 18. Circle No. 74.

Truck bodies, hoists—a catalog of the wide-ranging Converto line of truck bodies and hoists. Includes a trouble-shooting chart for hydraulic systems, as well as charted data on weights of materials, various concrete batches, and the ratio of body capacities to height of sides. Specifications on different types of cylinders.

Write to the Converto Mfg. Co., Inc., Dept. C&E, Third and Green Sts., Cambridge City, Ind., or use the Request Card at page 18. Circle No. 73.

Diesel crawler—a booklet on the International TD-6 diesel crawler. Emphasizes the versatility of the unit because of a number of new attachments and accessories. Form CR-628-H.

Write to the International Harvester Co., Construction Equipment Division, Dept. C&E, 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 125.

Pipe benders—literature on the wide range of Wallace ram benders for pipes of various sizes. Illustrated. Specifications included.

Write to the Wallace Supplies Mfg. Co., Dept. C&E, 1300 Diversey Pkwy., Chicago, Ill., or use the Request Card at page 18. Circle No. 58.

Shovels, cranes, hoes—a brochure showing a wide range of Lorain equipment at work on a variety of jobs. Brief descriptions of performances. Photographs.

Write to The Thew Shovel Co., Dept. C&E, 28th and Fulton Road, Lorain, Ohio, or use the Request Card at page 18. Circle No. 78.

Concrete form—a fact sheet on Georgia-Pacific's GPX concrete form, made of high-density plastic-surfaced plywood. According to the literature, the form permits a maximum number of reuses and gives extra-smooth surfaces with a minimum of refinishing. Specifications; sizes and prices; on-the-job photographs.

Write to the Georgia-Pacific Corp., Dept. C&E, Equitable Bank Bldg., 421 S. W. Sixth Ave., Portland 4, Ore., or use the Request Card that is bound in at page 18 of this issue. Circle No. 105.

Versatile self-propelled hammer—literature on the Ottawa Hydra-Hammer, a self-propelled, one-man-operated unit for breaking concrete pavement; tamping backfill, rock, or heavy aggregate; cutting asphalt; compacting blacktop patches; and driving guardrail posts and short

KEEP OUR ROADS ON THE GO

American Bridge helps you build more road for the money!

piling. Illustrated with action photographs.

Write to the Ottawa Steel Division, Young Spring & Wire Corp., Dept. C&E, 435 S. Main, Ottawa, Kans., or use the Request Card at page 18. Circle No. 103.

Dragline buckets—literature on Hendrix dragline buckets. Available in capacities from ¼ cubic yard to 40 cubic yards, the buckets are offered in three types for every digging purpose: lightweight, general, and heavy-duty.

Write to the Hendrix Mfg. Co., Inc., Dept. C&E, Mansfield, La., or use the Request Card at page 18. Circle No. 62.

Form-tying devices—a handbook on the full line of Richmond form-tying devices, anchorages, and accessories. Over 400 devices offered. Illustrated.

Write to the Richmond Screw Anchor Co., Inc., Dept. C&E, 816–838 Liberty Ave., Brooklyn 8, N. Y., or use the Request Card at page 18. Circle No. 63.

Jaw crushers—a catalog describing 13 crusher sizes in the Rogers heavy-duty line and 7 sizes in the Roadbuilder series. Illustrations include on-the-job photographs, close-ups of component parts, and a large cutaway view, with descriptions, of the inside working parts. Also contains dimensional drawings, capacity tables, and a product chart of size percentages.

Write to the Rogers Iron Works Co., Dept. C&E, P. O. Box 869, Joplin, Mo., or use the Request Card at page 18. Circle No. 126.

Accessories for concreting—a catalog covering the comprehensive Sure-Grip line of accessories and specialties for concrete construction. Includes specifications and is well illustrated with photographs and drawings.

Write to the Dayton Sure-Grip & Shore Co., Dept. C&E, 304 Kercher St., Miamisburg, Ohio, or use the Request Card at page 18. Circle No. 127.

Utility tractor—a 10-page illustrated booklet listing recommended uses for Allis-Chalmers D-14 and D-17 utility tractors. Applications fall under headings of county and state highway departments, road-building contractors, excavating contractors, municipalities, and others. Bulletin UT-105.

Write to the Allis-Chalmers Mfg. Co., Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 20.

Hydraulic jacks—literature on Dudgeon hydraulic jacks offered in capacities to 600 tons. According to the company, the jacks are designed for pile testing, underpinning, bridges, pipe-pushing, and other special applications.

Write to Richard Dudgeon Inc., Dept. C&E, 789 Bergen St., Brooklyn, N. Y., or use the Request Card at page 18. Circle No. 64.

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Multipurpose grease cartridge—information on the Sinclair Litholine multipurpose grease cartridge. According to the company, the unit fits all regular cartridge-type guns and eliminates mess, spilling, and waste.

Write to the Sinclair Refining Co., Technical Service Division, Dept. C&E, 600 Fifth Ave., New York 20, N. Y., or use the Request Card at page 18. Circle No. 67.

Auger drill—a bulletin on the McCarthy heavy-duty vertical auger drill, said to drill from 3 to 24-inch-diameter holes at the rate of 400 to 800 feet per day. Illustrated. Bulletin M-100.

Write to The Salem Tool Co., Dept. C&E, 806 S. Ellsworth Ave., Salem, Ohio, or use the Request Card at page 18. Circle No. 66.

Track components—a comprehensive discussion of track shoes and hardware in a booklet from the Caterpillar Tractor Co. Illustrated with photographs, drawings, and diagrams; provides useful information on the selection and rebuilding of track components. Helpful tips on the selection of track shoes for special applications. Form DE844.

Write to the Caterpillar Tractor Co., Dept. C&E, Peoria, Ill., or use the Request Card at page 18. Circle No. 128.

Heavy-equipment trailer—a fact sheet on the Load King Model D-15-D heavy-equipment trailer. Details the design features of the 27-ton-capacity unit and is illustrated with photographs and a dimensional drawing. Data on optional equipment.

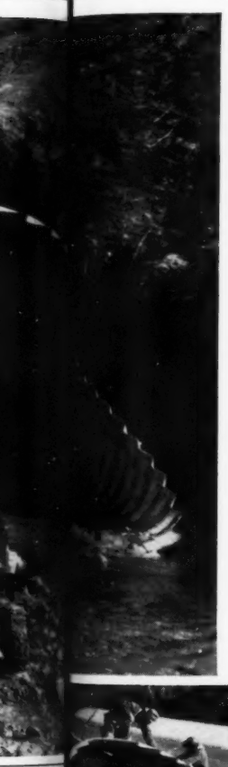
Write to the Load King Trailer Co., Dept. C&E, Elk Point, S. Dak., or use the Request Card at page 18. Circle No. 60.

Fluid drives and couplings—a 24-page bulletin describing the expanded line of Flexidyne dry fluid drives and couplings, and illustrating their uses in crushing plants, conveyor setups, and other construction applications. Complete specifications. Bulletin A-640B.

Write to the Dodge Mfg. Co., Dept. C&E, 1944 S. William St., Mishawaka, Ind., or use the Request Card at page 18. Circle No. 40.

Pumps—a revised bulletin giving a total of 19 tables to aid in the selection of Blackmer power-driven pumps ranging in size from 1¼ through 8 inches, with capacities from 10 to

←For more facts, circle No. 283



These Structures were furnished to Prince Georges County, Maryland—John H. Marburger, Jr., Administrator of Public Works—by Lane-Penncarva, Inc., Bealeton, Virginia.

Twin Beds for Winkledoodle

. . . or a quick, low-cost way to remove a roadblock

Winkledoodle is a quiet little creek which runs through a real estate development in the Maryland suburbs of Washington.

But sometimes even an innocent-looking stream like Winkledoodle becomes a headache when it blocks progress by dead-ending a street which ought not to be dead-ended. Solving such a problem is less difficult than you might think, as you can see from the experience of the Department of Public Works of Prince Georges County, Maryland.

Serving as giant twin-covered beds for Winkledoodle, long pipe-arch drainage structures shown here were made of USS AmBridge Sectional Plate. They each have a 12′6″ span, a 7′11″ rise, and are 112′ long. Each was erected in the bed of the temporarily diverted stream in just *five working days* by a five-man crew, plus crane.

Job Superintendent says: "They went together easier than any in my experience."

The dimensional accuracy of prefabricated USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches assures precision fit in the field. In fact, Arthur Richards, Bridge Superintendent, enthusiastically says that the Winkledoodle drainage structures went together easier than any in his experience. He was also impressed with the uniform curvature of the interchangeable plates.

No forms needed . . . no breakage

USS AmBridge Sectional Plate Pipe, Pipe-Arches and Arches eliminate the need for forms. And, being made of steel, there is no breakage. They are permanent. And they can be extended whenever the road is widened. Fabricated to meet all federal and state specifications, they are available in a complete range of standard sizes to satisfy the design requirements for area of waterway openings.

For a free copy of our 28-page AmBridge Sectional Plate Catalog, write direct to our Pittsburgh Office. For information on smaller drainage structures made from USS Galvanized Corrugated Culvert Sheets, please send your inquiry to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa.

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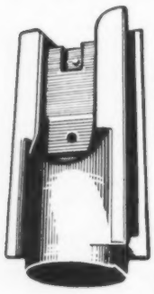
American Bridge Division of USS United States Steel

General Offices: 525 William Penn Place, Pittsburgh, Pa.
Contracting Offices in: Ambridge · Atlanta · Baltimore · Birmingham · Boston · Chicago · Cincinnati
Cleveland · Dallas · Denver · Detroit · Elmira · Gary · Houston · Los Angeles · Memphis · Minneapolis
New York · Orange, Texas · Philadelphia · Pittsburgh · Portland, Ore. · Roanoke · St. Louis
San Francisco · Trenton · United States Steel Export Company, New York

DEPENDABLE SEMI-STEEL PILE HAMMERS



PILE DRIVER HAMMERS

Well designed of tough close grained semi-steel to give maximum impact for easy reeving. Can be adopted to fit present leads. Fast service in sizes 2000 lbs. to 4000 lbs. in 250 lb. increments.

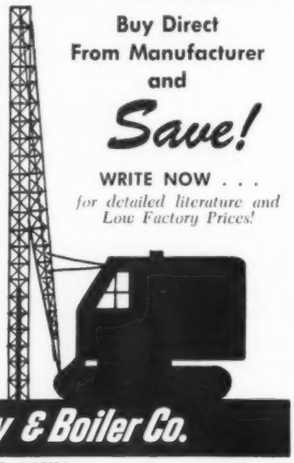
FOLLOW BLOCKS

Sturdy semi-steel. Quick delivery on all sizes for hammers weighing 2000 lbs. to 4000 lbs.

SWINGING LEADS One Section All-Steel

Lengths 20' 25' 30' 35' 40'

Maintain your pile drivers at top efficiency with this low cost replacement equipment.



Buy Direct From Manufacturer and

Save!

WRITE NOW . . .

for detailed literature and Low Factory Prices!

Sioux City Foundry & Boiler Co.

East 8th & Division SIOUX CITY 2, IOWA Phone 5-7967

For more facts, use Request Card at page 18 and circle No. 284

Product Literature

1,580 gpm at differential pressures up to 125 psi. Also contains a 6-step selection procedure for choosing the most suitable pump for a given application. Bulletin No. 20.

Write to the Blackmer Pump Co., Dept. C&E, 1809 Century Ave. S. W., Grand Rapids 9, Mich., or use the Request Card at page 18. Circle No. 77.

Bulk-material vibrator—a catalog describing the Peterson Vibrolator and its use as a vibrator for screens, hoppers and bins, batch plants, etc. Discusses design and performance characteristics, and shows several models of the unit, giving specifications for each. Well illustrated with photographs and dimensional drawings.

Write to the Martin Engineering Co., Dept. C&E, Neponset, Ill., or use the Request Card at page 18. Circle No. 129.

Heaters, steam generators—literature describing Malsbary automatic heaters and steam generators, and telling how they may be used to heat materials for winter operations at a ready-mix plant. Also discusses the use of steam generators in the curing of precast-concrete products. Illustrated.

Write to the Malsbary Mfg. Co., Dept. C&E, 845 92nd Ave., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 130.

Drilling tools—a catalog containing illustrations and specifications of Brunner & Lay carbide drill bits, drill rods, air-tool accessories, moil points, clay spades, asphalt cutters, and many others. Includes suggestions on how to make carbide drill bits do more work, last longer, and cost less; plus instructions for sharpening and hardening moil points, digging chisels, etc. Catalog No. 358.

Write to Brunner & Lay, Inc., Dept. C&E, 9300 King St., Franklin Park, Ill., or use the Request Card at page 18. Circle No. 97.

Cylinder, block testing—a pamphlet describing in detail, and in nontechnical language, the complete procedures for preparing and testing blocks and cylinders in the plant or on the job site. Covers preparation and capping, methods and procedure of testing, and causes of substandard results.

Write to Forney's Inc., Tester Division, Dept. C&E, P. O. Box 310, New Castle, Pa., or use the Request Card at page 18. Circle No. 131.

Welding supplies, accessories—a 52-page catalog of Airco welding supplies and accessories. Covers the firm's complete line of fluxes and ferrous and nonferrous rods for gas welding, as well as a wide range of accessory items for both arc and gas welding. Form ADC-848C.

Write to the Air Reduction Sales Co., division of Air Reduction Co., Inc., Dept. C&E, 150 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 132.

Surveying instruments—a bulletin on the David White Model 8007 level transit and Model 8025 level, both designed for light construction. Lists and illustrates the many features of the units. Also shows a tripod, rod and target, and true sight hand level. Prices included.

Write to the David White Instrument Co., Dept. C&E, 2051 N. 19th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 53.

Torque converters—a folder listing the benefits of Rockwell-Standard Hydra-Drives heavy-duty torque converters. Cutaway drawing and text emphasize simplicity of construction. Converter selection chart. Specifications.

Write to the Rockwell-Standard Corp., Transmission and Axle Division, Dept. C&E, Detroit 32, Mich., or use the Request Card at page 18. Circle No. 134.

Hydraulic tire demounter — a fact sheet on the Bos hydraulic tire demounter, designed for heavy-duty tires in rim sizes from 15 to 24 inches. Photos show the unit in use.

Write to the Everhot Mfg. Co., Dept. C&E, 57 S. 19th Ave., Maywood, Ill., or use the Request Card at page 18. Circle No. 135.

Diamond bits—an illustrated folder on Hoffman Bros. thin-wall diamond surface-set and impregnated core bits. Also contains data on water swivels, adapters, and core barrels, as well as on the firm's water-pressure regulator and pressure gage for installation on the drilling machine, designed to insure a constant water supply under a given load.

Write to the Hoffman Bros. Drilling Co., Dept. C&E, Box 426, Punxsutawney, Pa., or use the Request Card at page 18. Circle No. 136.

From Washington to Maine . . .

The number of Bucyrus-Erie crane-excavators owned by Harrison Bros., Tacoma, Washington, is 13, including recently-purchased 30-B and 54-B models. Here, a 1½-cu. yd. 38-B shovel, one of five Bucyrus-Eries on this project, loads rock, dirt, and boulders on a 4.2-mile section of a state highway through Snoquolmie Pass.

W. H. Hinman, Inc., North Anson, Maine, keeps busy on scattered road and street projects in New England. This 25-ton 22-B Transit Crane, one of 11 Bucyrus-Eries owned by Hinman, is unloading steel stringers for use in building an interchange on the New Hampshire Turnpike near Dover.

Repeat owners enjoy profits of Bucyrus-Erie quality . . . you can, too

"Sure we like Bucyrus-Eries, or we wouldn't own a fleet of 'em!" — states the job superintendent for Harrison Bros., Tacoma, Washington. That's the simple way repeat owners express their satisfaction in the year in, year out moneymaking ability of Bucyrus-Erie equipment.

These experienced road-building contractors are just a few of the thousands of Bucyrus-Erie owners across the country who are completely sold on the versatile performance, steady output, low cost maintenance, and dependable long life of these fully convertible crane-excavators. They prove their satisfaction with repeat purchases.

You can start enjoying the same extra profits by putting one or more of these rugged Bucyrus-Eries on your next road job. 468E58

See your distributor today or write direct for the complete story. Bucyrus-Eries are available in a wide range of sizes: from ⅜ to 4-cu. yd. capacities as a shovel, dragline, crane, or clamshell; and from ⅜ to 2½-cu. yd. as a hoe.

A Familiar Sign... BUCYRUS ERIE ***. . . at Scenes of Progress***

BUCYRUS-ERIE COMPANY • SOUTH MILWAUKEE, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 285

To obtain the literature described on this page, write to the manufacturer or circle the designated number on the Request Card at page 18.

Mobile soil-testing labs—a brochure on Soiltest mobile testing laboratories for soils explorations, soils studies, and quality control of concrete and asphalt. Contains illustrations and diagrams, as well as groupings of the apparatus needed to perform various ASTM tests in all three fields. Brochure ML-100.

Write to Soiltest, Inc., Dept. C&E, 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 137.

Motor graders—a catalog listing seven models of Adams motor graders. Well illustrated with on-the-job photos, sketches of main components, charts. Data on accessories. Specifications.

Write to the LeTourneau-Westinghouse Co., subsidiary of Westinghouse Air Brake Co., Dept. C&E, 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 138.

Portable welder—a brochure describing the Lincoln Weldanpower, a portable welder that also supplies power. Text and photographs stress the unit's versatility. Includes specifications and output ratings.

Write to The Lincoln Electric Co., Dept. C&E, 22801 St. Claire Ave., Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 139.

Small mixer—an illustrated bulletin on the Kwik-Mix standard 6 PM plaster-mortar-terrazzo mixer. Emphasizes such features as end-to-end mixing action, "four-way" sealed mixing drum, all-welded box frame, and simple power drive.

Write to the Kwik-Mix Co., division of Koehring Co., Dept. C&E, 235 W. Grand Ave., Port Washington, Wis., or use the Request Card at page 18. Circle No. 140.

Rotary discharge gates—a bulletin on Type G rotary gates for dust collection, pneumatic conveying, and feeding applications. Illustrates and describes four models: Style 4, with a 4-blade open-end rotor; Style 6, with a 6-blade open-end rotor; Style 6C, with a 6-blade closed-end rotor; and Style SP, with either a 4 or 6-blade "shallow-pocket" rotor. Brief specifications. Bulletin V-3558.

Write to the Ducon Co., Inc., Dept. C&E, 147 E. Second St., Mineola, N. Y., or use the Request Card at page 18. Circle No. 141.

Hydraulic tools—a generously illustrated catalog of the Manco Guillotine line of hydraulic tools. Includes descriptions of wire and rod cutters, straighteners, benders; shears for bars and channels, angle irons, tubing; power units, valves, and accessories. Photos show typical applications. Brief specifications. Catalog 158.

Write to the Manco Mfg. Co., Dept. C&E, Bradley, Ill., or use the Request Card at page 18. Circle No. 142.

Steam cleaners — literature on Chem-Therm steam cleaners, offered in capacities of 140, 150, and 180 gpm. Describes butane, gas, and oil-fired models. Photos illustrate text.

Write to the Chem-Therm Mfg. Co., Dept. C&E, Shamrock and Evergreen Sts., Monrovia, Calif., or use the card at page 18. Circle No. 143.

Air clutch—an illustrated bulletin on the Conway Stationaire air clutch. Lists such benefits as stationary air housing, middle-shaft mounting accommodation, no shaft drilling, and no rotating union. Bulletin No. 858.

Write to The Conway Clutch Co., Dept. C&E, 1105 Marshall St., Cincinnati, Ohio, or use the Request Card at page 18. Circle No. 144.

Jacking rod working loads—for prestress producers, others, a chart showing safe working loads for Midland jacking rods up to 3½-inch diameter × 24 feet long. Covers five types of thread.

Write to the Midland Machinery Corp., Dept. C&E, 519 E. William St., Decatur, Ill., or use the Request Card at page 18. Circle No. 145.

Small tractor shovel—a specification sheet on the Trojan Model T-18 tractor shovel, a small multi-purpose unit featuring six interchangeable buckets in sizes from 14 to 29 cubic feet. Illustrated with a photograph and dimensional drawing.

Write to The Yale & Towne Mfg. Co., Contractors Machinery Division, Dept. C&E, Clinton St., Batavia, N. Y., or use the Request Card at page 18. Circle No. 146.

Transit mixers—a booklet detailing the design and operating characteristics of Rex Adjusta-Wate Moto-Mixers. Generously illustrated with on-the-job photographs, close-ups of major components, and drawings.

Write to the Chain Belt Co., Dept. C&E, 4701 W. Greenfield Ave., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 147.

Roller—a folder describing the Ingram 10-ton roller. Special emphasis on the unit's Revers-O-Matic drive and the Timken bearing steering roll assembly. Contains photographs and specifications.

Write to the Acme Iron Works, Dept. C&E, 540 Culebra Ave., San Antonio, Texas, or use the Request Card at page 18. Circle No. 148.

Diesel engines—a booklet detailing the design and operating characteristics of Allis-Chalmers Models D-516 and D-344 diesel engines furnishing 131 and 88 horsepower, respectively. Well illustrated with photographs, charts, and cutaway drawings.

Write to the Allis-Chalmers Mfg. Co., Engine-Material Handling Division, Dept. C&E, P. O. Box 512, Milwaukee, Wis., or use the Request Card at page 18. Circle No. 149.

Core drill—literature on the Acker Hillbilly core drill. Stresses such features as portability, maneuverability, and ability to drill at any angle. Photographs illustrate text. Specifications included. Bulletin No. 29.

Write to the Acker Drill Co., Inc., Dept. C&E, P. O. Box 830, Scranton, Pa., or use the Request Card at page 18. Circle No. 150.

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FOR HIGHWAY REPAIR

One man can measure as fast as he normally walks when using the Rolatape 400. Total is automatically recorded in full view of the operator.

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SNO-THRO SNOW BLOWER

Adaptable to all Tractor Shovels with a one-yard capacity or greater
Adaptable to all 4 Wheel Drive Trucks

FAST, ECONOMICAL SNOW REMOVAL UNIT

For States, Cities, Counties, Parks, Cemeteries, Airports, Industrial Plants, Material Yards, Snow Removal Contractors.

- Loads 7 to 12 cu. yds. snow per minute.
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- Attached in a few minutes.
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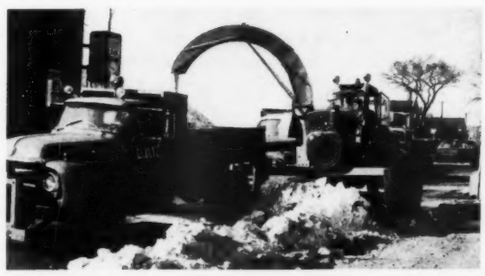
- 38-inch rotor driven by roller chain.
- Close-coupled mounting makes for stability and ease of control.
- Boom arms raise blower unit clear of ground for transport.



Compare before you buy. The price is lower. Performance is greater. Call for a demonstration on your snow removal problem.

KRAUSE INDUSTRIES, BARABOO, WIS.

For more facts, use Request Card at page 18 and circle No. 287

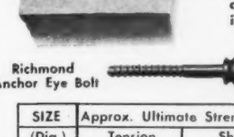
Be sure with Richmond Screw Anchors when anchoring to cast concrete

Screw Anchors were originally designed and developed by Richmond Screw Anchor Company many years ago. They are drawn and fabricated to Richmond specifications to do a sure, non-slip anchorage job in concrete. There are similar products on the market but you will always be safe with Richmond Screw Anchors and Anchor Bolts because of their greater, tested strength. The Richmond Anchor, with greater diameter for anchorage, weighs more and has more holding power where it counts the most.

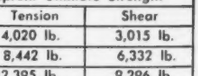
The Richmond Screw Anchor is a helical coil wound of flat steel wire to fit the contour of the special skein thread of the Richmond Anchor Bolt. The Anchor provides a steel reinforcing for the concrete thread and transmits the load from the bolt to the surrounding masonry. Available black or galvanized in ⅜" to 1½" nominal diameters.

Use for permanent installations includes anchorage of cleats, bollards and fender systems, etc. to concrete docks and piers; anchorage to column bases in structural steel construction; and a great variety of uses in railroad work and other heavy industries.

Use for temporary installations includes tunnel form anchorage to previously poured inverts; anchorage of cantilever lift forms in dam construction; pile and beam lifting with Anchor Eye Bolts; and anchorage of bracket supports for overhead form structures to eliminate costly shoring and bracing.



Richmond Screw Anchor and Bolt assembly in concrete.



Richmond Anchor Eye Bolt

SIZE (Dia.)	Approx. Ultimate Strength	
	Tension	Shear
⅜"	4,020 lb.	3,015 lb.
½"	8,442 lb.	6,332 lb.
⅝"	12,395 lb.	9,296 lb.
¾"	18,291 lb.	13,718 lb.
⅞"	26,331 lb.	19,748 lb.
1"	34,505 lb.	25,879 lb.
1¼"	51,590 lb.	38,693 lb.
1½"	80,802 lb.	60,602 lb.

The Richmond Screw Anchor and Bolt Assembly provide for permanent or temporary, cast in place anchorage to concrete. For more information about their varied application in concrete construction and strength data send for your copies of the Richmond Data Book on Lifting Inserts and the current Richmond Handbook, which shows the more than 400 Richmond-engineered Tying Devices, Anchorages and Accessories—Write to:

For more facts, circle No. 288

Own tire expert is contractor's sure ticket to cost-cutting

by CARL D. SMITH
consultant on giant off-highway tires

A well trained and efficient maintenance crew is vital to the contractor's profitable operation, and thoroughly trained tire service men are by no means an unimportant part of the maintenance crew.

We have seen in the preceding articles that control of tire operating costs is important, both because of the initial cost of large off-highway tires and because of the losses resulting from downtime. Proper attention to off-highway tires throughout their operating life is only good business practice.

The experience of many of those closest to this problem is that the contractor is in the best position to cut tire costs when he has his own men trained in tire service.

Just for the record, it might be well here to point out that the "free" tire service offered to contractors by distributors of off-highway tires is seldom actually free. Quite often this service charge is included in the initial cost of the tire or realized in some other way. This point is made merely to clarify the fact that tire service is usually paid for by the recipient in one way or another.

Too few factory men

The type of technical assistance a contractor needs to help him keep tire operating costs down is not generally available from tire service men or tire changers. There are exceptions, of course; some of these service men are highly trained in the whole field of giant off-highway tire operation and maintenance. But they are comparatively rare.

Nor can the contractor depend on the help of factory-trained men, for the simple reason that there are not enough of these around. And when this technical service is needed, a contractor cannot afford to wait until a factory representative gets around to him. These representatives simply cannot visit contractors often enough to properly guide their tire programs.

There is a further common-sense angle in the matter of tire inventory. A contractor's investment in off-highway tires is a sizable one, and he should not put this inventory into the hands of a relative stranger. In other words, when a contractor has a tire inventory valued at $75,000 or $100,000, he will certainly want to entrust it to someone whose training and judgment he knows and respects. Decisions as to repairing, recapping, and the like can mean hundreds of dollars in profits or losses to the contractor. To leave these decisions to a tire changer whom the contractor has known for only a day or two would seem to be the poorest kind of business practice.

Certainly the most efficient way for a contractor to keep his giant off-highway-tire costs down is to have on his payroll a man thoroughly trained in all phases of tire operation and maintenance, one who has both the knowledge and the personal interest in getting the longest possible tire life out of these expensive items.

What expert must know

This regular member of the contractor's crew should know as much as possible about the whole field of off-highway-tire operation and maintenance. In particular, he should know:

a. The type of tire best suited for the particular job at hand.

b. The proper inflation to be used in getting the longest service and best yard or ton mileage from a particular tire.

c. The effect of speed, load, and roadway conditions on the various tires used in the fleet.

d. The condition of each tire in the contractor's fleet. This is best accomplished by a daily inspection and a twice-daily check of the tires in operation.

e. The causes of abnormal wear and cuts in a tire. These should be called to the attention of the operator or foreman so that they may be corrected.

"ON THE JOB WHEN YOU WANT THEM!"

SYLGAB
STEEL and WIRE ACCESSORIES for Fast
FIREPROOFING
of Structural Steel

RIGID BEAM CLIP
5' lengths
— installed with lightning speed.
Made of #12 or #10 gauge galvanized.

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HAUNCH STIFFENER
for beams over 16" deep. Made of #10 or #12 gauge galvanized wire.

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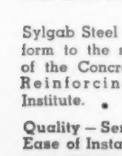

TOGGLE HANGERS
More rigid than any wire. Used in conjunction with
SYLGAB SNAP-ON HAIRPIN CLIP
to tie main and cross furring together.

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Sylgab Steel & Wire Accessories conform to the specifications of the Concrete Reinforcing Steel Institute.

Quality — Service
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BEAM CLIPS • SPECIAL COLUMN CLIPS
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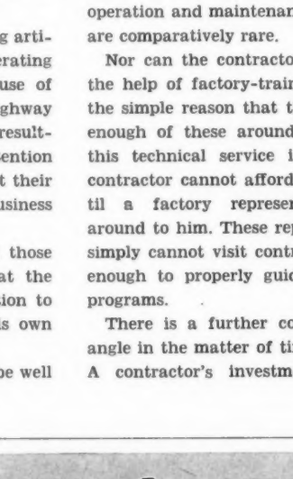
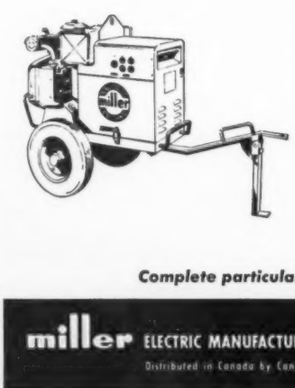
THE ENGINE-DRIVEN WELDER/POWER PLANT with the



100% DUTY CYCLE

An original Miller design with performance standards, ruggedness and versatility that have made it a top hand from the Texas oil fields to New York dairy farms. Because, whether the AEA-200-L is hub deep in mud welding a derrick brace, or supplying power for lights and milking machines, or answering an emergency call aboard a repair ship. . . . IT DELIVERS. Currently a best seller in the highway construction market, the Miller AEA-200-L is handily the "finest in the field," and here's why:



- All-weather construction
- Onan 12.9 h.p. air-cooled engine coupled directly to generator
- Full 225 ampere output
- 100% DUTY CYCLE
- 5 KW, 110/220v ac
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- Uses any ac or ac-dc 1/16" to 3/16" electrodes
- Seven station amperage selection with continuous current control

Other Miller welder/power plants for metallic arc and TIG welding to 350 amperes.

Complete particulars will be sent promptly.

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Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal

For more facts, use Request Card at page 18 and circle No. 290

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The World's Finest Low-Cost Precision Testers
For
CYLINDERS
CUBES
BLOCKS
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IF IT'S A CONCRETE TESTER YOU NEED-GET IN TOUCH WITH

FORNEY'S, Inc.
TESTER DIVISION
P. O. BOX 310 · NEW CASTLE, PA.

For more facts, circle No. 291

f. How to repair all cuts and injuries to the tire without removing it from the machine.

g. How to judge when tires, injured to the point where they cannot be repaired on the machine, are still worth repairing for further successful service.

h. When to pull a tire out of service for recapping. This implies also that he knows it will render good service again after being recapped.

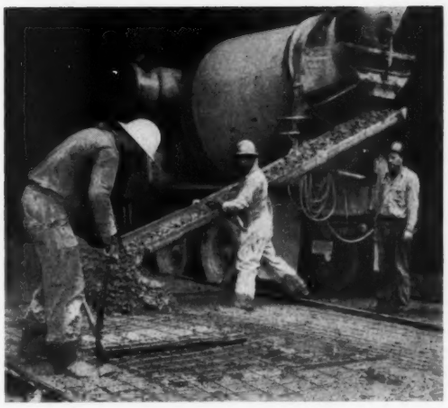
It goes without saying that this tire expert should have all the information and tools available to him to do a good job. He will thus be able to save the contractor money by anticipating tire maintenance needs and correcting conditions that are adverse to long, satisfactory tire life.

THE END

Welding aluminum by inert-gas process

Information designed to train and qualify individuals in welding aluminum by the inert-gas process is presented in "Weldor's Training Manual", a 144-page booklet available from Kaiser Aluminum & Chemical Sales, Inc. The 3-part manual discusses the basic theory of aluminum welding and contains illustrations of practical exercises.

A copy of the booklet may be obtained free when requested upon company letterhead; a charge of $1 per copy is made when the booklet is requested for personal use. All copies may be obtained from the company's Technical Publications Dept., 919 N. Michigan Ave., Chicago 11, Ill.



CONCRETE PAVING of Pittsburgh's Fort Pitt Tunnel brings the big twin-tube project a step nearer to completion. The second course of concrete is being chuted over welded-wire fabric reinforcing in one of the 50-foot-long pavement sections, while the workman, left, cuts reinforcing around an access trap in the lane. Merritt-Chapman & Scott Corp., New York City, is the general contractor on the project, which will be completed in 1960 to link Pittsburgh and the main route to the airport.

Sound-slides give tips on tractor-shovel care

Seven 20-minute color slide films teach the step-by-step procedures of the care and maintenance of Michigan tractor shovels, produced by the Construction Machinery Division of Clark Equipment Co. The films, projected in frames and accompanied by a long-playing record, are aimed at the semi-skilled mechanic, who is familiar with basic material-handling machinery and servicing tools but unfamiliar with torque converters or power-shift transmissions.

Further information on viewing the films may be obtained by calling a local Michigan distributor or writing to the Clark Equipment Co., Construction Machinery Division, Pipestone Road, Benton Harbor, Mich.

AGC issues reprints from safety manual

The Associated General Contractors of America has published two sectional reprints—Scaffolding and Ladders, Booklet A, and Explosives and Powder Actuated Tools, Booklet B—from its "Manual of Accident Prevention in Construction", designed for the use of superintendents, foremen, and workers at construction sites. The fifth revised edition of the complete manual was published a few months ago, and includes many substantial changes and additions brought about by technological advances in the industry.

Booklets A and B may be purchased individually or in quantities at 15 cents per single copy, $1.20 per dozen, and $9 per hundred. They may be obtained by writing to the AGC, 20th and E Sts. N. W., Washington 6, D. C.

Universal represents West German crane firm

Universal Mfg. Corp., Zelienople, Pa., is the exclusive United States representative for the Hans Liebherr Co., West Germany, producer of Towercranes, hydraulic excavators, and automatic batch plants. Universal will market the cranes and other Universal-Liebherr products through a nationwide sales and service organization.

QUICK TO PLEASE!

Fast Pickup Service

. . . That's what you get from Southern Tire's giant tire retreading experts. Fast pickup and delivery *at your job site . . . after work hours.* Saves you *costly equipment downtime.* Where time and money count, Southern Tire's fast service has proved invaluable time and again in hundreds of jobs. Whether you operate light or heavy equipment, regardless of what your particular job requirements are, Southern Tire can supply the size and tread design best suited to your needs. For superior quality workmanship and fast, efficient service you can depend on, call on Southern Tire Company for your large tire retreading and repair.

New Tire Mileage for Approximately Half the Cost!
Over 55,000 Tires Worth of Experience!

Always Deal With an Independent . . . Free to Serve You Rapidly and Efficiently No Matter What Territory . . . Regardless of Distance

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For more facts, use Request Card at page 18 and circle No. 292

with PUNCH-LOK Hose Clamps

There are no projections to catch or snag. Punch-Lok's double-wrapped steel band and "lok" are flush with the surface of the hose. Uniform clamping action compresses the hose evenly all around the fitting to secure a leakproof connection stronger than the hose itself.

See your nearby Punch-Lok Distributor

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Dept. J, 321 North Justine Street, Chicago 7, Illinois

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Harbormaster
the complete, heavy-duty marine power and steering package

easily installed, rugged, economical, highly maneuverable

Harbormaster Outboard Propulsion and Steering gives your craft rugged power, plus complete 360° maneuverability and the advantages of low cost installation, operation and maintenance.

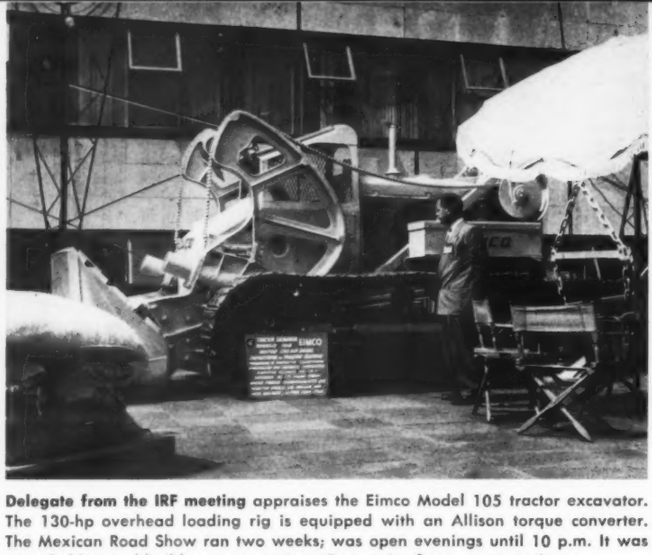
Harbormasters are easily installed for immediate use and are a ready answer to many tough marine problems. They are ideal in shallow or deep water . . . for coastwise service as well as in harbors, lakes, canals, and rivers.

Harbormasters have been proved in hundreds of installations. Send for your copy of catalog which gives complete details.

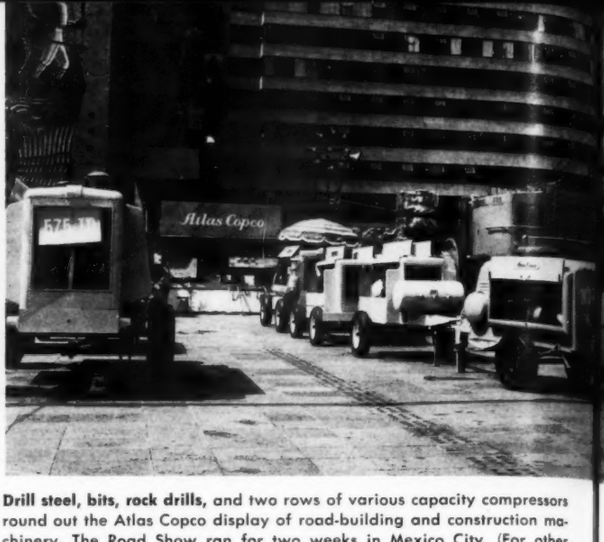
MURRAY & TREGURTHA, INC.
44 Hancock St., Quincy 71, Massachusetts

For more facts, circle No. 294

Construction camera



Delegate from the IRF meeting appraises the Eimco Model 105 tractor excavator. The 130-hp overhead loading rig is equipped with an Allison torque converter. The Mexican Road Show ran two weeks; was open evenings until 10 p.m. It was attended by road builders representing 45 countries from every continent.



Drill steel, bits, rock drills, and two rows of various capacity compressors round out the Atlas Copco display of road-building and construction machinery. The Road Show ran for two weeks in Mexico City. (For other photos and a report of the IRF meeting see pages 6 and 7.)

Form smoother columns ...easier...quicker!

J. F. Fitzgerald Expressway, Boston, Mass.
M. DeMatteo Construction Company, general contractors

For the smoothest continuous concrete column surfaces, use

SONOCO
Seamless Sonotube®
FIBRE FORMS

With the Seamless Sonotube Fibre Forms, columns form better, strip quicker and finish easier! Developed by Sonoco for use where smoother column surfaces are desired, this premium form saves you time, money and labor!

Whenever there's a round concrete column to be finished . . . there's a Sonoco Sonotube Fibre Form to do it . . . faster, and more economically than any other way!

Low-cost SONOTUBE Fibre Forms handle easily and require minimum bracing . . . can be ordered in specified lengths or sawed to size on the job.

Choose the Sonoco fibre form that best fits your requirements . . . the Seamless Sonotube, the patented "A" Coated Sonotube (standard form for finished columns) or the "W" Coated Sonotube (for columns where finishing is not required).

Order in sizes from 2" to 48" I.D. in standard lengths of 18 ft. Other lengths can be furnished to meet special requirements.

See our catalog in Sweet's

For technical information and prices, write

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SONOCO
Construction Products
SONOCO PRODUCTS COMPANY

3084

For more facts, use Request Card at page 18 and circle No. 295

Prequalification for Pennsylvania contractors

Prequalification rating of highway contractors is being initiated by the Pennsylvania Department of Highways. Under the new policy, which is in accordance with a recommendation of the Automotive Safety Foundation, contractors will be required to furnish financial statements, performance statements, and equipment-availability statements twice a year. The statements will be studied in the department, and each contractor will receive a rating enabling him to bid up to a specified dollar volume.

Advertisements for construction will contain the proviso that a contractor must submit an up-to-date financial statement with his bid. The statement must be dated no more than 20 days prior to the time when bids are to be opened.

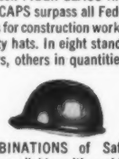
Contractors will also be rated on the type of work for which they are eligible, such as roadway, bridge, or general construction.

The department will further require its 11 district engineers to file a performance rating on each contractor now at work. This rating will deal with the physical performance of the contractor's forces—how well they are organized, whether they do the work on time, and how efficiently they conduct the project.

A contractor's own performance statement will summarize the work he has done.

The new policy aims to permit more efficient operation of the contract construction program and to speed the award of contracts. Previously, two to eight weeks have elapsed between receipt of bids and award of contracts.

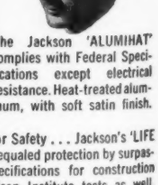
Christmas Seals help fight tuberculosis—buy and use them!



Jackson FIBER GLASS HATS and CAPS surpass all Federal tests for construction workers' safety hats. In eight standard colors, others in quantities.

COMBINATIONS of Safety Caps available with welding helmets, goggles, face shields.

The 'TOP HAT' for Safety . . . Jackson's 'LIFE GUARD' offers unequaled protection by surpassing Federal Specifications for construction workers' and Edison Institute tests as well. A HAT and a CAP in white, yellow, and grey.



The Jackson 'ALUMIHAT' complies with Federal Specifications except electrical resistance. Heat-treated aluminum, with soft satin finish.

tops

• TOPS IN COMFORT

To men who wear safety hats all day long, comfort is important. Jackson hats and caps fit well and bear smoothly and evenly on the head.

See how little it takes to fit the headband to clearly marked hat sizes. And, being easy to fit, men will fit these hats accurately, so they stay on better in windy weather. Chin straps and winter-liners are also available.

The polyethylene headband is smooth and flexible, yet firm enough to hold its shape. A soft-backed leatherette sweatband fits all around.

• TOPS IN STYLE

They protect without looking bulky and have a well designed, uncluttered look. Easy to clean, they keep their shiny, smooth finish.

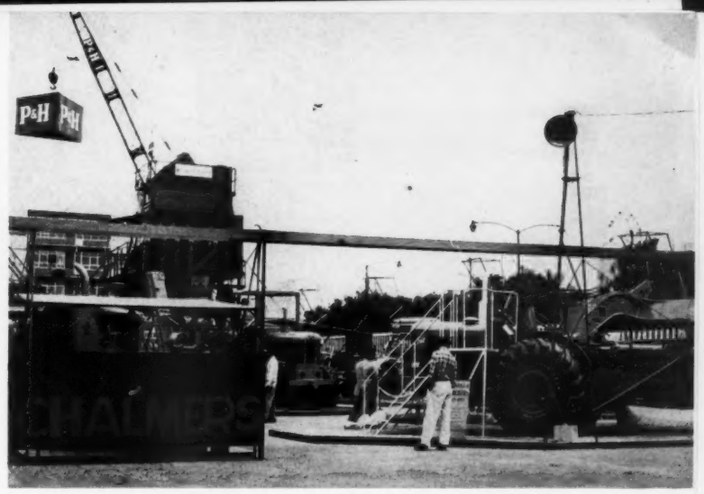
• TOPS IN SAFETY

Thorough comparative testing against published industry-accepted standards proved that Jackson's three types of safety hats, each in its own class, offer an extra margin of safety. They should be your choice.

Jackson Products
AIR REDUCTION SALES CO., A DIVISION OF AIR REDUCTION CO., INC.
31739 Mound Road, Warren, Michigan
Sold through Welding Supply and Safety Dealers

For more facts, use Request Card at page 18 and circle No. 296

General Motors shows off a Euclid rubber-tire scraper, an end-dump truck, and one of its diesel engines at an exposition of road-building machinery in Mexico City. The south-of-the-border Road Show was staged in conjunction with the third world meeting of the IRF.



Allis-Chalmers International put on parade its tractors, scrapers, front-end loaders, graders, and diesel engines. High in the rear is the long boom of a P&H crane at the Harnischfeger exhibit, towering over a Barber-Greene bituminous plant. Many rigs on display were sold during the show.

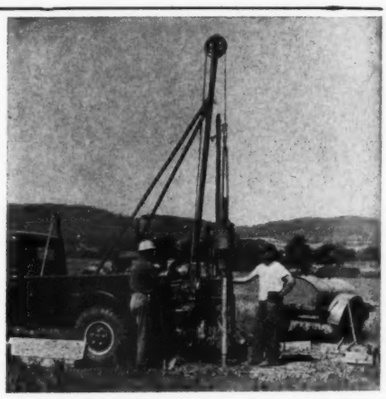
BPR survey shows state policies on contractors' qualifications for jobs

The U. S. Bureau of Public Roads has recently completed a survey of federal-aid project procedure, for calendar year 1957, showing state practices in regard to contractors' qualifications. Of the 51 highway departments—including Hawaii, Puerto Rico, and the District of Columbia—38 require prequalification by contractors prior to their receiving proposal forms for formal bidding; eight permit qualification at the time bidding proposals are presented at a letting, to be acted on before award can be made; and five require postqualification.

For the benefit of state highway departments and the contracting industry, the BPR urges states to revise any existing requirements that tend to be contrary to federal-aid regulations. It also asks them to decrease the time required to process qualification statements, so that any interested, but unqualified, contractor will have ample opportunity after a project is advertised to submit appropriate questionnaires in time to bid on a specific project.

The BPR also suggests that states increase the advertising period to allow ample time for job evaluation by contractors; take into account the types of work and the sequences in which the work can be performed; consider letters of credit as capital assets in reviewing and analyzing contractors' questionnaire statements. It recommends extending prequalification requirements to subcontractors, if this will assist in expediting approval when a prime contractor proposes subletting any of his work. Another suggestion is that states require handling of contracts by all delegated authorities—such as counties, cities, and utilities—to fully comply with all state requirements.

DEPENDABLE SOIL SAMPLING EQUIPMENT IS NO PROBLEM FOR THIS DRILL CREW

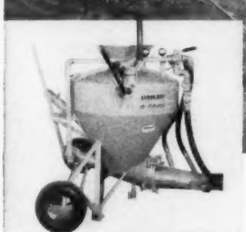


With a contract to obtain representative samples of the soil strata along the center line of an important link on the new Interstate Highway System, this contractor is using the S&H Split Barrel Sampler for recovering samples in this immediate area. At the next location, sampling for a bridge foundation, the S&H Shelby Tube Sampler will be utilized to recover the undisturbed samples that are necessary.

Sprague & Henwood's sampling equipment is designed for long, dependable service with a resulting minimum cost. The complete line of sampling devices and equipment is described in the new Bulletin 300.

SPRAGUE & HENWOOD, Inc.
SCRANTON 2, PA.
MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.
New York — Philadelphia — Atlanta — Pittsburgh — Grand Junction, Colo. — Buchans, N.F.
EXPORT REP.: PHILIPS EXPORT CO., 100 EAST 42ND ST., N.Y. 17, N.Y. CABLE ADDRESS: PHILYORK

For more facts, use Request Card at page 18 and circle No. 297



Model CP-15

The new AIRPLACO Concrete Placers make *any point* on the job accessible for the concrete pour. This low-cost, highly flexible method is the first real answer to profitable conveying and distribution of all types of structural concrete. The photo above shows just one application of the new AIRPLACO method. Now, transit-mix trucks can avoid muddy roads and hard-to-get-to discharge points. You save time, money and materials.

LOOK AT THESE ADVANCED FEATURES

- Maximum Flexibility
- Portability to and from the job
- Mobility on the job
- Ideal for Big and Small Jobs—up to 25 cu. yd. per hour
- Handles All Standard Mix Structural Concretes
- Easy to Operate
- Low Cost

AIRPLACO Offers You Other Profit Producing Equipment

Send for FREE Brochure

Write today for your copy of the AIRPLACO Concrete Placer brochure. Get all the facts today and save on that job tomorrow.

CONCRETE GUNS—Bondactor and Nucretor
MIX-ELVATORS—Automatic, Continuous Dry Mixer for All Guns—available in 3 models
GROUTERS—G-6 portable grouter
SANDBLASTERS—Jet-Blaster—in 2 models

AIRPLACO AIR PLACEMENT EQUIPMENT CO.
1007 West 24th St., Kansas City 8, Mo.
MANUFACTURERS OF ADVANCED DESIGN CONCRETE GUNNING, PLACING, MIXING, GROUTING AND SANDBLASTING EQUIPMENT.

For more facts, use Request Card at page 18 and circle No. 298

Management

Clerical organization:

Bookkeeping

This is the thirty-seventh of a series of articles on Construction Management by George E. Deatherage, P. E., consultant to National Schools of Construction Management and Heavy Equipment Operation, P. O. Box 527, Weiser, Idaho, and P. O. Box 8243, Charlotte, N. C. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by the National Schools. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees at the foreman level or its equivalent, who need practical help in order to take complete charge of construction projects themselves.

by GEORGE E. DEATHERAGE, P. E.
construction consultant

Bookkeeping rules apply to any business, but each type of enterprise has its own special requirements when it comes to this kind of paper work. Perhaps the most extensive information on bookkeeping for the construction industry is contained in "Practical Accounting and Cost Keeping for Contractors", by Frank R. Walker, which is published by the Frank R. Walker Co., 173 W. Madison St., Chicago 2, Ill., for $5. All journal and ledger sheets contained in this volume are designed especially for the construction industry.

The key to the system is the self-balancing cash-journal, Figures 1, 2, 3, and 4, and the use of this one sheet will furnish all the information any contractor needs to keep complete business records, including a monthly trial balance.

The various ledger sheets are used for keeping detailed accounts with persons or concerns with which the contractor is doing business; accounts with all subcontractors; and also miscellaneous accounts, such as capital account, profit and loss, etc. A small contractor may or may not use all the accounts, depending on the amount of time at his disposal and the information desired for the various classes of accounts. However, all of the accounts may be kept in detail by giving only a few hours to the book one or two evenings a month.

Cash-Journal

The self-balancing Cash-Journal is divided into columns covering every class of expenditure entering into a contractor's business.

Assume, for example, that a contractor spent $4.20 for gasoline for a truck. The sheet would show that he paid Nelson's garage $4.20, which is entered in the second column, Figure 1, headed Cash or Bank Account—Disbursements; then, on the same line in the ninth column, Figure 2, headed Truck and Automobile Expense, the same amount is entered. This entry gives the amount paid out and what it was spent for. Every other entry is made in exactly the same manner.

At the end of each month this sheet is totaled, and the total amount of all items entered in the columns headed DR, signifying debits, should balance with the total of all columns headed CR, denoting credits.

This sheet eliminates filling out checkbook stubs, since it furnishes a complete record of all checks written.

To obtain the bank balance at any

DE-WATERING PROBLEMS LICKED

FLYGT ELECTRIC PUMPS

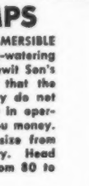
Contractors throughout the world find FLYGT SUBMERSIBLE ELECTRIC PUMPS tops in performance on any de-watering problem. Users such as Bechtel Corp. and Peter Kiewit Son's Co. like FLYGT foolproof features, the advantage that the pumps work in any position, and the fact that they do not clog up. FLYGT PUMPS are low in initial cost, low in operating expense, require little attention . . . save you money.

FLYGT SUBMERSIBLE ELECTRIC PUMPS range in size from 1½"-85 GPM capacity to 8"-3000 GPM capacity. Head capacities range up to 210 feet. Weights range from 80 to 1200 pounds.

CHECK THESE FLYGT FEATURES

✓ Electric ✓ Submersible ✓ Heavy Duty
✓ Resistant to Salt Water ✓ Will Pump High Amount of Solids ✓ Quick and Easy to Service
✓ Easy to Handle ✓ Operates Unattended ✓ No Installation Costs
✓ Low Maintenance Costs ✓ Runs Dry Without Damage ✓ No Priming Needed

WRITE FOR NAME OF YOUR NEAREST DEALER



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ON ALL WINTER JOBS
USE INSTO-HOT® PORTABLE LP-GAS HEATERS

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Clean, economical, dependable heat to keep construction work UP when the temperature goes DOWN. Get the facts and you'll get INSTO-HOT. Mail coupon today.

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AT LAST—High Speed combined with power, outstanding performance, rugged get-up-and-go—bring you everything you've been looking for in a truck!

And what a selection! Whatever your job, here's the truck for you. **The rough and ready Mack! The powerful, rugged GMC! The outstanding Reo "Eager Beaver!"** Each model the latest, most advanced truck engineering available today—at prices so low it's hard to believe. All with steel cab kits.

Contact us, too, for the complete line of unused army trucks!

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Memphis, Tennessee

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821 Lincoln Way West
Chambersburg, Pennsylvania

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with a ® HYDROSCALE on your crane hook!

Automatically weigh any load you lift

Simplifies Industrial Weighing—Anywhere Your Crane Will Reach

ALL WEIGHING IS DONE ON YOUR CRANE HOOK
ENGINEERED AND BUILT FOR LONG SERVICE-LIFE
THERE ARE 110 MODELS IN THE COMPLETE LINE
TARE ADJUSTING KNOBS FOR NET LOAD READING
EASY-TO-READ DIALS AVAILABLE IN 3 SIZES

HYDROSCALES guaranteed
They are guaranteed to be free of defects in workmanship and materials, and to be accurate to ½ of 1% of the maximum dial capacity

HERE ARE SOME TYPICAL WEIGHING APPLICATIONS
Just a few of the many applications include — loading, unloading, check weighing, batching, foundry charging, and protecting your equipment from overloading.

HYDROWAY SCALES, INC.
31298 Stephenson Highway • Royal Oak, Michigan
"The world's largest producer of crane scales"

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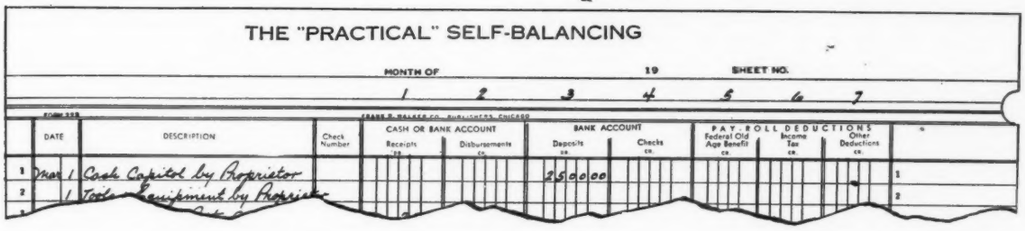
Figure 1.


THE "PRACTICAL" SELF-BALANCING

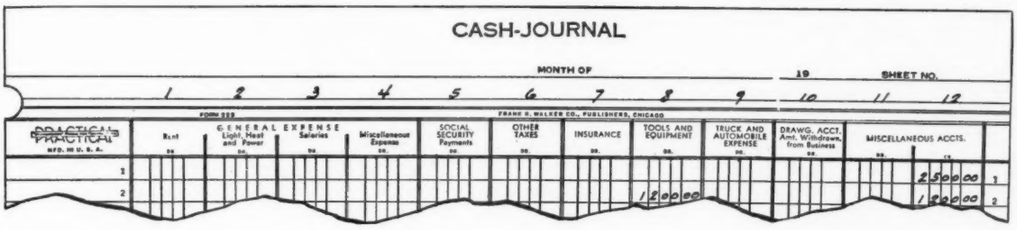
MONTH OF 19 SHEET NO.

1 2 3 4 5 6 7

FORM 222 FRANK B. WALKER CO., PUBLISHERS, CHICAGO

DATE	DESCRIPTION	Check Number	CASH OR BANK ACCOUNT Receipts	CASH OR BANK ACCOUNT Disbursements	BANK ACCOUNT Deposits	BANK ACCOUNT Checks	PAY-ROLL DEDUCTIONS Federal Old Age Benefit	PAY-ROLL DEDUCTIONS Income Tax	PAY-ROLL DEDUCTIONS Other Deductions	
1 Mar 1	Cash Capital by Proprietor				250000					1
2 1	Tools + Equipment by Proprietor									2

Figure 2.


CASH-JOURNAL

MONTH OF 19 SHEET NO.

1 2 3 4 5 6 7 8 9 10 11 12

FORM 222 FRANK B. WALKER CO., PUBLISHERS, CHICAGO

PRACTICAL MFD. IN U.S.A.	Rent	GENERAL EXPENSE Light, Heat and Power	GENERAL EXPENSE Salaries	GENERAL EXPENSE Miscellaneous Expense	SOCIAL SECURITY Payments	OTHER TAXES	INSURANCE	TOOLS AND EQUIPMENT	TRUCK AND AUTOMOBILE EXPENSE	DRAWG. ACCT. Amt. Withdrawn from Business	MISCELLANEOUS ACCTS.	
1											250000	1
2								120000			120000	2

time, subtract the total of the fourth column headed Bank Account-Checks from the total of the third column headed Bank Account-Deposits, Figure 1. The difference is the bank balance.

The columns in the Cash-Journal headed Cash or Bank Account and Bank Account are called Control Accounts because they control the receipts and expenditures of the business. Sufficient Control Accounts for practically any contractor's business are carried in the Cash-Journal.

Additional Control Accounts or cost subdivisions may be carried in the Cash-Journal by merely inserting another short sheet, Figures 3 and 4, between the left and right-hand pages. This short sheet uses the same descriptive columns as the left-hand Cash-Journal sheet and furnishes six additional Debit-Credit control accounts or 12 additional cost subdivisions. Any number of short sheets may be used. Both the Cash-Journal and the short sheets furnish records that are complete and flexible enough for any business.

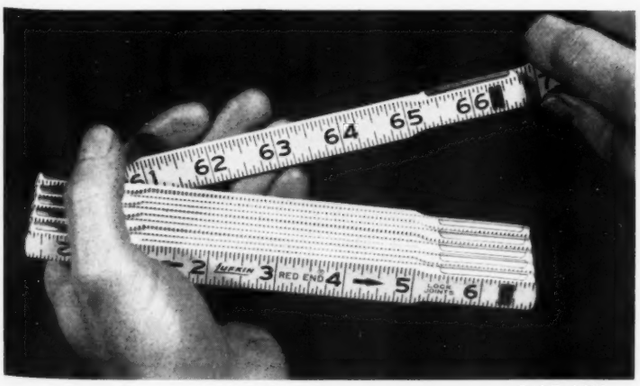
Handling accounts

Let us assume that the business was started on March 1 and that the proprietor invests $2,500 cash in the business. The amount is entered in the column headed Bank Account-Deposits and under Miscellaneous Accounts-Credit. If the business is a partnership, separate capital accounts should be kept for each partner or member of the firm, showing the amount of money invested by each. If the business is a corporation, this amount should be carried in the ledger under the heading of Capital Stock Account.

When the owner or members of the firm put tools or equipment, instead of cash, into the business, the fair cash value of the items should be computed and entered under Tools and Equipment and under Miscellaneous Accounts-Credit.

A withdrawal check from the bank for petty-cash expenditures is noted in the column headed Bank Account-Checks; the same amount is entered under Cash or Bank Account-Receipts.

(Continued on next page)



Red End 066

CLICK! It locks like a latch

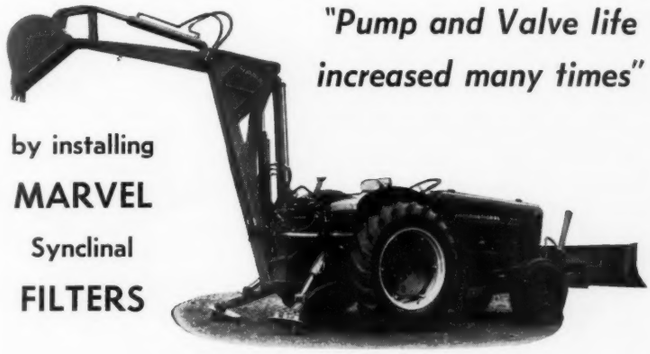
Open and close any Lufkin Red End . . . and listen to those joints. Click! Click! Click . . . like a well-fitted latch!

Now open it all the way. Pull any two sections. Not a bit of end play, not a trace of sloppiness. Hold it by the center section . . . edge up . . . fully extended. See how the tightly locked joints refuse to fold even when you shake it.

These features are all part of the reason why so many carpenters and craftsmen won't buy any rule but a Lufkin Red End.

THE LUFKIN RULE COMPANY
TAPES • RULES • PRECISION TOOLS
SAGINAW, MICH. • MIDDLETOWN, N.Y. • BARRIE, ONT.

For more facts, use Request Card at page 18 and circle No. 303



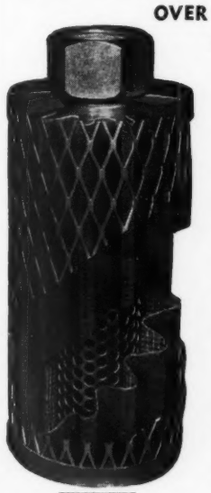
"Pump and Valve life increased many times"

by installing MARVEL Synclinal FILTERS

PIPPIN Excavator and PIPPIN Angling Bulldozer

Pippin Construction Equipment, Inc. (Manufacturers) White River Junction, Vt. advise that—"Originally the PIPPIN Excavator was not equipped with a filter. Due to this, excessive pump, valve and cylinder wear was experienced. Since installing the Marvel Synclinal Filter, pump and valve life has been increased many times. Of utmost importance is the fact that customers are better satisfied and maintenance has been reduced to a minimum."

OVER 800 other Original Equipment Manufacturers are installing MARVEL SYNCLINAL FILTERS as Standard Equipment!


SUMP TYPE (cutaway)

MEET J. I. C. STANDARDS

A SIZE FOR EVERY NEED

Available for sump or line installation in capacities from 5 to 100 G.P.M. Greater capacities may be attained by multiple installation (as described in catalog). Choice of Monel mesh sizes range from coarse 30 to fine 200.

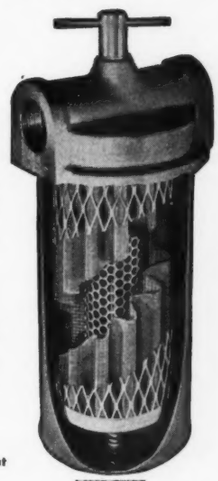
EASY TO CLEAN

Both sump and line types are easily disassembled, thoroughly cleaned and reassembled, on the spot, in a matter of minutes. Line type operates in any position and may be serviced without disturbing pipe connections.

IMMEDIATE DELIVERY

All sizes and models listed in catalogs are stock items and shipment can be made immediately upon receipt of your order.

For further information write, wire, phone or use coupon


LINE TYPE (cutaway)

Catalogs containing complete data available on request

MARVEL ENGINEERING COMPANY
7227 N. HAMLIN AVE.,
CHICAGO 45, ILLINOIS
Phone: JUNIPER 8-6023

Without obligation, please send me complete data on Marvel Synclinal Filters, as indicated—

☐ Catalog #108—For Hydraulic Oils, Coolants, Lubricants
☐ Catalog #200—For Fire-resistant Hydraulic Fluids (Aqueous Base)
☐ Catalog #400—For Fire-resistant Hydraulic Fluids (Synthetic)
☐ Catalog #301—For Water

(CE-12)

Name .....
Company .....
Address .....
City .....
State .....

For more facts, use coupon

Figure 3.

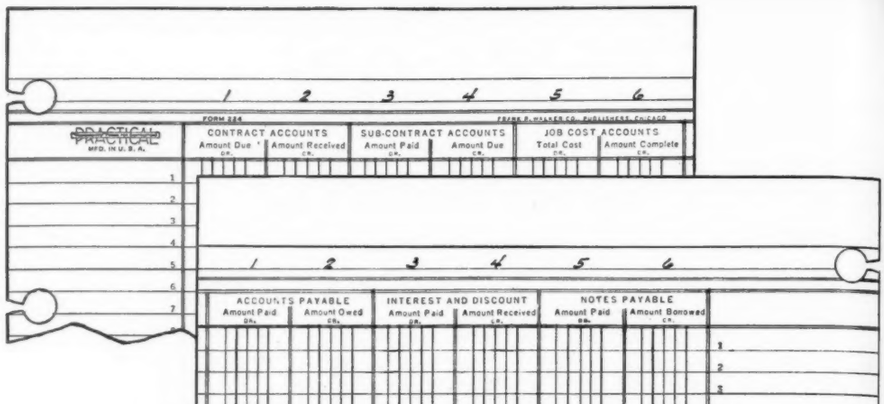
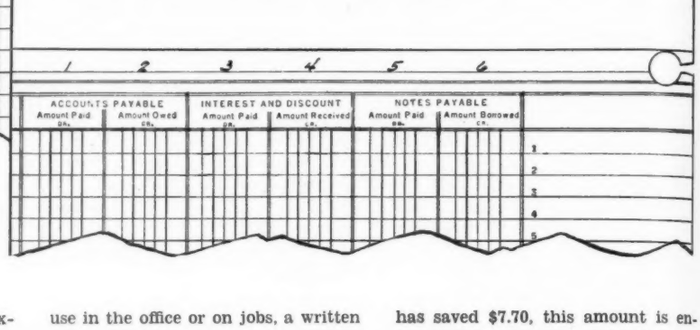


Figure 4.



This is merely transferring money from the bank to the petty-cash account, or your own pocket.

A business conducted by an individual or partners should have an account for the owner or each partner headed Personal Account or Drawing Account. If the business is a corporation, and each active officer or stockholder does not draw a regular salary, then a separate account should be carried for each active member of the corporation. When the owner or one of the members of the firm withdraws money from the business for his personal use, the amount withdrawn is entered under Bank Account-Checks and under Drawing Account-Amount Withdrawn from Business.

Expenditures for rent, light, heat, power, advertising, stationery, and other miscellaneous items should be charged to overhead or General Expense. The amount of the check for each item should be entered under Bank Account-Checks and also under General Expense.

Invoices

When materials are purchased for use in the office or on jobs, a written order should be given—stating the quantity required, kind of material, price, and terms—to eliminate future controversies regarding payment. The amount of the invoice is entered under Accounts Payable-Amount Owed and under Job Cost Accounts-Total Cost.

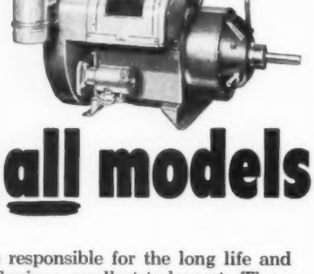
Assume, for instance, that an invoice for $385 is paid promptly and the owner takes a 2 per cent cash discount, which comes to $7.70. Therefore, the amount of the check is $377.30, and is entered under Bank Account-Checks. Since the contractor has saved $7.70, this amount is entered under Interest and Discount-Amount Received.

The $385 was entered under Accounts Payable-Amount Owed before the invoice was paid. Now that the bill is paid, the amount should be entered under Accounts Payable-Amount Paid. These two columns now balance, showing the bill is paid in full.

Frequently, there are bills to be paid where an account is not carried in the ledger with the concern from

(*Continued on page 114*)

HEAVY DUTY 3 TO 56 HP. features in all models



HEAVY DUTY FEATURES are responsible for the long life and rugged performance of Wisconsin Engines, smallest to largest. These *quality-proven* HEAVY DUTY features include: forged crank shaft with thrust-absorbing tapered roller bearings at both ends; forged connecting rods; precision-built outside magneto, with impulse coupling, sealed against dust and moisture; positive lubrication at all operating angles; flywheel fan maintaining proper cooling from sub-zero to 140° F.

Write for bulletin S-223 describing all HEAVY DUTY Wisconsin Air-Cooled Engines. Electric starting equipment available on all models.

More than 2,000 service stations . . . several near you.

WISCONSIN *Air-Cooled* **ENGINES**

WISCONSIN MOTOR CORPORATION
World's Largest Builders of Heavy-Duty Air-Cooled Engines
MILWAUKEE 46, WISCONSIN

For more facts, use Request Card at page 18 and circle No. 304

STOP that WATER

A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—hold 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs. Applied quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.
With FORMULA No. 640

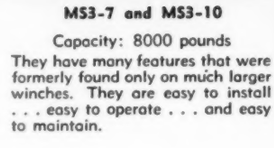
Now!
BUY used equipment
SELL used equipment
ACQUIRE competent personnel
Use a classified ad in
CONTRACTORS & ENGINEERS

If You Own a Truck — You Need a BRADEN Winch!

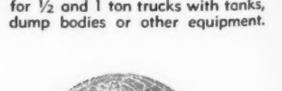
Many truck owners say the most useful piece of equipment they own is a winch. That's because a winch saves hundreds of man-hours a year by taking over those handling jobs that are difficult to do without mechanical help.

Pictured below are two of the smaller BRADEN winches that have hundreds of uses. They are designed for smaller trucks or tractors . . . are easy to operate and made to last.

See your nearest BRADEN dealer for information on the entire line of BRADEN Truck Winches.



MS3-7 and MS3-10
Capacity: 8000 pounds
They have many features that were formerly found only on much larger winches. They are easy to install . . . easy to operate . . . and easy to maintain.



MSU3-10
Capacity: 8000 pounds
Underslung model for under body mounting behind cab, and the "F" series for front end mounting. Ideal for ½ and 1 ton trucks with tanks, dump bodies or other equipment.

Write for Catalog

BRADEN WINCH COMPANY
P. O. Box 547, Broken Arrow, Oklahoma

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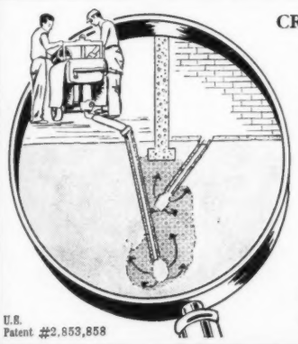

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Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300% —special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

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which the materials or supplies were purchased. This occurs where just an occasional purchase is made or for such items as telephone, electric light, and other miscellaneous expenses. In these cases, the only entry is made at the time the bill is paid, and then it is charged direct to the proper account.

When materials are taken from stock and sold for cash, the total amount received is entered in the column Cash or Bank Account-Receipts. The same amount is entered under the heading Miscellaneous Accounts-CR. If the material sold was cement, the amount is later transferred to the Cement Stock account in the ledger.

If the cement is sent to a job, the cost of the cement is entered under the heading Job Cost Account-Total Cost and the same amount under Miscellaneous Accounts-CR. The amount is later transferred to the Cement Stock account in the ledger.

Entries covering a promissory note for a bill are similar. Since the contractor pays the invoice by note instead of check, the transaction requires the transfer to the amount from Accounts Payable to Notes Payable. A bill for $400, for instance, is first entered in the first column of the short left-hand page headed Accounts Payable-Amount Paid. The same amount is entered in the sixth column, Notes Payable-Amount Borrowed. When payment is made, the price, plus the interest, is entered in the large sheet in Bank Account-Checks. The interest alone is entered in the short page in Interest and Discount-Amount Paid. The amount of the bill, minus interest, is entered in the fifth column of the short left-hand page headed Notes Payable-Amount Paid.

Weekly payrolls are figured into the month's Cash-Journal. The weekly payroll, minus deductions for various purposes, might amount to $215. This is entered under Job Cost Accounts-Total Cost. Payroll deductions will be listed in columns provided for that purpose. If individual checks are made out for employees, the check number may be used opposite each man's name on the payroll sheet and one entry made on the Cash-Journal sheet for all payroll checks.

Similar procedures take care of invoices from subcontractors, payment of subcontractors by note, the sending of invoices, and payment received from the owner.

Balancing books

At the top of each column on both the left and right-hand pages, there appear in small type DR and CR, debit and credit. For every entry in the DR column there are also entries in the CR columns, totaling the same amount. These entries, when correctly made, keep the books in balance at all times. At the end of each month, all the columns on both pages should be added up and the total of each column written at the bottom.

After the columns have been totaled, the amounts of all columns having DR at the top should be listed and added together. When this is finished, the same thing is done with the CR columns. If all entries have been correctly made and the additions are correct, the total of the DR columns equals the total of the CR columns. The books balance.

This furnishes a complete picture of the business each month and also furnishes a complete trial balance of each month's business.

At the end of each month, when the Cash-Journal sheet is totaled and balanced, the totals of the various accounts should be transferred or posted to their proper accounts in the ledger. This enables the contractor to start each month with a clean Cash-Journal sheet, while the various ledger accounts contain a complete summary of the year's business up to the current month.

(Next month's article will deal with "Clerical organization: The Ledger".)

Copies of "Earthmoving—An Art and a Science", by Dan K. Heiple, chief field engineer at LeTourneau-Westinghouse Co., Peoria, Ill., are available without charge from that company.

The October issue erroneously stated that copies were available from another company.

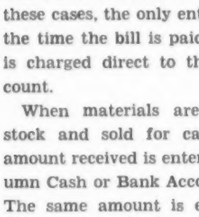
I-H truck sales center opens in Indiana

A Truck Sales Processing Center has been opened in Fort Wayne, Ind., by the International Harvester Co., Chicago, Ill. The object of the center is to offer improved customer and dealer service through fast delivery and modification of I-H heavy-duty models.

L. A. Weinmann is manager of the center, located at 5402 Moeller Road.

Goodrich builds Texas office, warehouse

A $250,000 warehouse and office building is being erected in Houston, Texas, for the B. F. Goodrich Co., Akron, Ohio. The 49,000-square-foot structure is located on a 4-acre tract on Produce Row in the southeastern portion of Houston. The single-story facility is expected to be completed in February.



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there will be a

1959 A. E. D. CONVENTION DAILY!

Again, for the third year, A.E.D. convention-goers will have the news of the 1959 meeting, while it is news, *right at the Convention!* Each day of the January 26-28 sessions at Chicago, a CONTRACTORS AND ENGINEERS news staff, headed by William H. Quirk, editor, and William T. Darden, managing editor, will provide complete, on-the-spot, word and photo coverage of the daily convention proceedings, industry personalities and the over-all color and highlights. A feature of special interest to dealers will be the DAILY's reports on manufacturers' exhibits in suites and in the Condex display.

As proved so popular and successful at previous conventions, the C & E DAILY will be distributed each morning, individually, to the hotel room of convention registrants. Additional copies will be available at registration desks and meeting rooms.

NOTE TO MANUFACTURERS — **The "A.E.D. CONVENTION DAILY" provides a *timely* way to attract new dealers for your line, *right while they are market-minded!* A good time, too, for you to check market goals and potentials. Let dealers know you're at the Convention (and where) with advertising in the "CONVENTION DAILY." Write for rates and a dummy showing ad sizes!**

The 1959 A.E.D. CONVENTION DAILY is another service to the Construction Industry provided by

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Surveying washington

by GEORGE RIVEIRE, JR.

Congress to question BPR on interstate highway system

The return of Congress next month will signal another extensive round of questioning on the progress of the Road Program. Foremost among the queries directed at the Bureau of Public Roads will be those concerning the interstate highway system.

The lawmakers, keeping a sharp eye on a multibillion-dollar investment, will want to know in fairly specific terms what's been done. BPR has detailed figures on "project" miles completed and currently under way for all the highway systems in each state, and can feed Congress all of this information—and a great deal more.

However, Congress is likely to press BPR into providing a figure the bureau is reluctant to publicize—the number of miles actually open to traffic that have been built on the Interstate System since the highway program started.

The difference between a mile of completed facility and a "project" mile is considerable, to say the least. A "project" mile relates to a single contract over that span, such as grading. Another mile is set down when that same stretch is paved or when structures are put in.

Talking in terms of "project" miles, BPR can proudly point out that since the start of the program in 1956, construction contracts have been completed on about 2,500 miles of the Interstate System. But the figure for completed facilities, where traffic is actually moving, doesn't sound impressive—about 500 miles.

While the "project" mile may not be the perfect measure of what has been done and is being done to modernize the nation's highways, it is a better index than completed facilities. Its flaw, from the standpoint of public information, is that it tends to exaggerate the progress being made. The average person, reading that a construction contract has been completed on a 100-mile roadway, wouldn't know that more work was to follow before it could be used.

FPC turns down plans for Tennessee-Canada gas line

Ambitious plans to build a 1,760-mile natural-gas pipeline from Tennessee to the Canadian border have been upset, at least temporarily. The Federal Power Commission rejected the project because, it said, there was insufficient evidence that adequate gas supplies could be secured from Canada. The application was filed four years ago by Tennessee Gas Transmission Co. and its subsidiary, Midwestern Gas Transmission.

FPC also turned down competing plans, filed by Northern Natural Gas Co. and Michigan Wisconsin Pipeline Co., to serve the upper Midwest. Fearful of a Tennessee-Midwestern invasion of their potential markets, the two firms had asked approval of their proposals to expand domestic transmission facilities.

Midwestern is refiling to construct one line to the Chicago area, the gas to be supplied by parent Tennessee. Another new Midwestern proposal contemplates another line to feed gas, some of it Canadian, to upper Michigan, Wisconsin, Minnesota, and North Dakota. To soften opposition, other pipeliners are being invited to participate in the system.

FPC expressed optimism that Canadian gas would inevitably become available to the U. S., with other firms besides Midwestern hooking up in international systems all along the border. There's no doubt that availability of ample supplies of Canadian gas would stimulate a good deal of additional pipeline building.

Fish become a key issue on Middle Snake River dam

Interior Secretary Fred Seaton wants to halt additional dam construction at this time on the Middle Snake River of the Columbia Basin below its confluence with the Imnaha River. The reason for this step: fish preservation.

Seaton says this reach of the Snake is the key remaining area in the Columbia system for producing anadromous fish, and that more dams should be deferred until the problem of fish passage over high dams has been licked. Solution is quite a way off.

The secretary's concern was prompted by plans of the U. S. Army Corps of Engineers to build some additional structures there. He urged the Army to forget about this for a while and to concentrate instead on the possibility of multipurpose dams on the Snake above the Imnaha as a way of comprehensively developing the water resources of the Pacific Northwest.

NEW DESIGNS IN CATERPILLAR EQUIPMENT AND PARTS DEPEND ON CREATIVE USE OF HIGHEST QUALITY STEEL

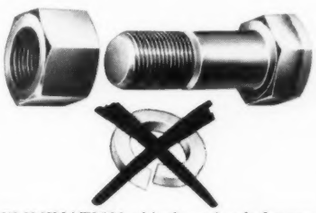
Example: Track hardware, made of stronger pre-tested steel and "Hi-Electro" hardened, stays tight without lock washers, often lasts through two sets of shoes

How much does it cost to pull a tractor off a job to tighten or replace track hardware? It costs plenty, in down time and in service time. That's why Caterpillar's new track hardware is such a good investment.

Caterpillar hardware normally stays tight without the use of lock washers throughout the service life of the first set of track shoes. And, exclusive "Hi-Electro" hardening of dome-shaped bolt heads often permits bolts to be used for a second set of shoes.

Most track hardware looks pretty much alike, but there's a big difference in quality. Steel, for instance. All steel for Caterpillar's new track bolts has a minimum tensile strength of 151,000 pounds per square inch, well above the SAE standard of 120,000-140,000.

The special steel accepted for track hardware is furnace-heated, quenched and tempered to toughen the entire bolt against breaking,



ELIMINATION of lock washer is feature of Caterpillar's new track hardware.

bending and the permanent stretching that leads to loosening of the nut.

Carbon, lost from the surface area in mill rolling and heat treating, is restored by Caterpillar with a carefully controlled, carbon-atmosphere process. Then threads are "rolled" into the bolt, curving the natural flow lines to follow the thread contours, producing threads that are highly resistant to stripping.

The large dome-shaped head receives an exclusive deep and even "Hi-Electro" hardening. This protects the hexagonal corners from mushrooming. Wrenches fit onto Cat bolts after many hundreds of hours of hard use.

This same quality of material, design and manufacture is found in *all* Caterpillar parts. And they're always available at your Caterpillar Dealer. See him today.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

SERVICE TIP

A torque wrench should always be used to tighten track hardware to factory-recommended torque values. Your Operating and Maintenance Instructions give exact values for each tractor model.

CATERPILLAR

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TENSILE STRENGTH of a bolt is tested in Caterpillar Laboratories. Each bolt is capable of supporting the full weight of the tractor for which it is designed.

DON KOPP, Master Mechanic, McCann & Co., Inc., Springfield, Ill.: "We're real boosters of genuine Cat parts, especially track parts. Other brands just don't last as long. When you buy Cat parts you know they are going to fit, last longer and give the best service because they are built to do the job by the people who built the machines."

For more facts, use Request Card at page 18 and circle No. 310

To a common long-haul problem,
this contractor found a new 262 hp 28 mph solution.

SAVING: $12 PER HOUR

You wouldn't think Alley Construction Company, Faribault, could save much, dozer-wise, on their 1,538,000 yd four-lane relocation of U. S. 14 west of Rochester, Minn. Certainly they would need a big 45,000 lb class crawler-dozer on their rock fill, and another on clean-up around their 2½ yd shovel, 1½ to (as hauls lengthened) 3½ miles away. But looking for a way to cut costs, they decided to test the speed of rubber. Based on the good service and high production of their three-year-old Michigan *Tractor Shovel*, their choice was a 262 hp Model 280 Michigan *Tractor Dozer*. They tried one . . . and bought it!

Spreads 5,000 yd rock daily

Main assignment for this 45,500 lb rubber-tired rig today is on the rock fill. Here, the Michigan is spreading truck-dumped material forward into a mucked-out roadbed. Its production has averaged 360 truck loads, 5,000 pay yards, of shot limestone per day (all the shovel can load). Its *capacity* on short-distance shuttle-type dozing like this "equals—possibly exceeds—that of comparable crawlers," according to Project Supt Les Paine. But there's an important difference . . .

Eliminates crawler in cut

Michigan's ability to do this tough assignment—*dependably*—has enabled the Alley company to utilize its truck-like speed to handle distant cleanup. Six or eight times a day the 28 mph Michigan makes a 5 minute, average 1½ to 2 mile trip to the shovel site. Here it quickly does necessary dozing. Then, quickly back to the fill it goes. Usual full-time assignment of a cleanup tractor is thus eliminated . . . *$12 per hour operating cost saved!*

Successfully loads big scrapers

"The Michigan not only has the power and dependability to doze rock," says Project Supt Paine, "but it also has done a good job push-loading 25 yard scrapers and pulling big rollers. Its advantages to us are many. Speed and size, of course. But also . . .

"1. Planetary-wheel axles and entire Clark-engineered and built power train. We feel this gives more efficiency and more usable power.

"2. Rear-end steering. Gets rig into tighter places. Good for cutting corners. Can doze full loads while turning.

"3. No clutching. Torque converter and power shift combination very good. Eliminates engine clutch, which, you know, doesn't stand up long on back-and-forth dozing.

"4. Interchangeability of power train and other parts between the Model 280 Dozer and our new 4 yard Model 275 Tractor Shovel (also, the Michigan 18 yard Model 210 Scraper). This design similarity (concludes Supt Paine) cuts parts stock needs—reduces training time for both operator and maintenance man."

If you, like this contractor, are one of the 8,000 owners of Michigan Tractor *Shovels*, you can save money with a Michigan *Dozer* on this similarity alone. Not to mention the savings and output increases possible because of greater dozer speed. Get an on-the-job demonstration for proof. There's a size Michigan to fit your needs: 165, 262, 375, 600 hp.

Michigan is a registered trademark of
CLARK EQUIPMENT COMPANY
Construction Machinery Division

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Benton Harbor 24, Michigan
In Canada:
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St. Thomas, Ontario

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